May 31, 1948

STEEL

The Magazine of Metalworking and Metalproducing

ESTABLISHED 1882

EDITORIAL INDEX, PAGE 19

TINNERMAN

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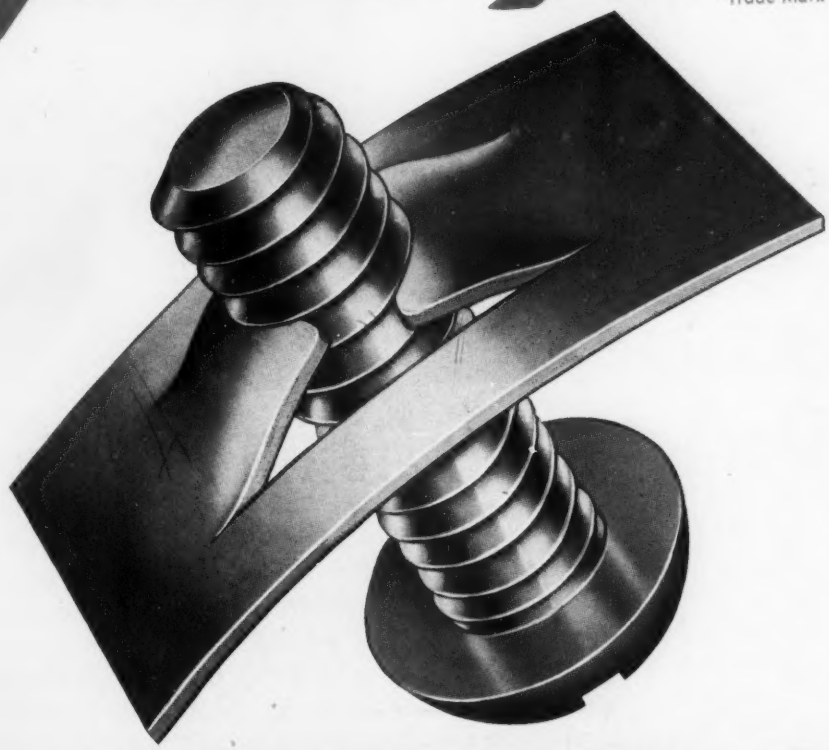

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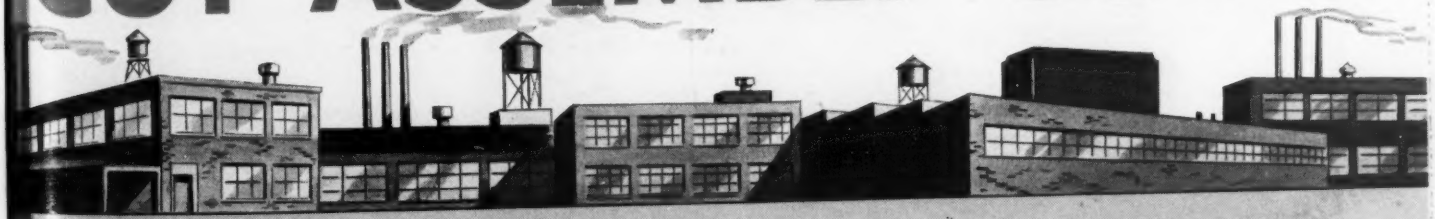

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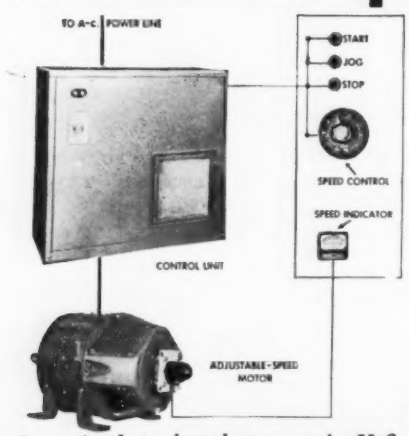

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Progress of Precision Investment Casting

Fundamentals of Forging Practice

Selection of Engineering Materials for Coke Plants

STEEL

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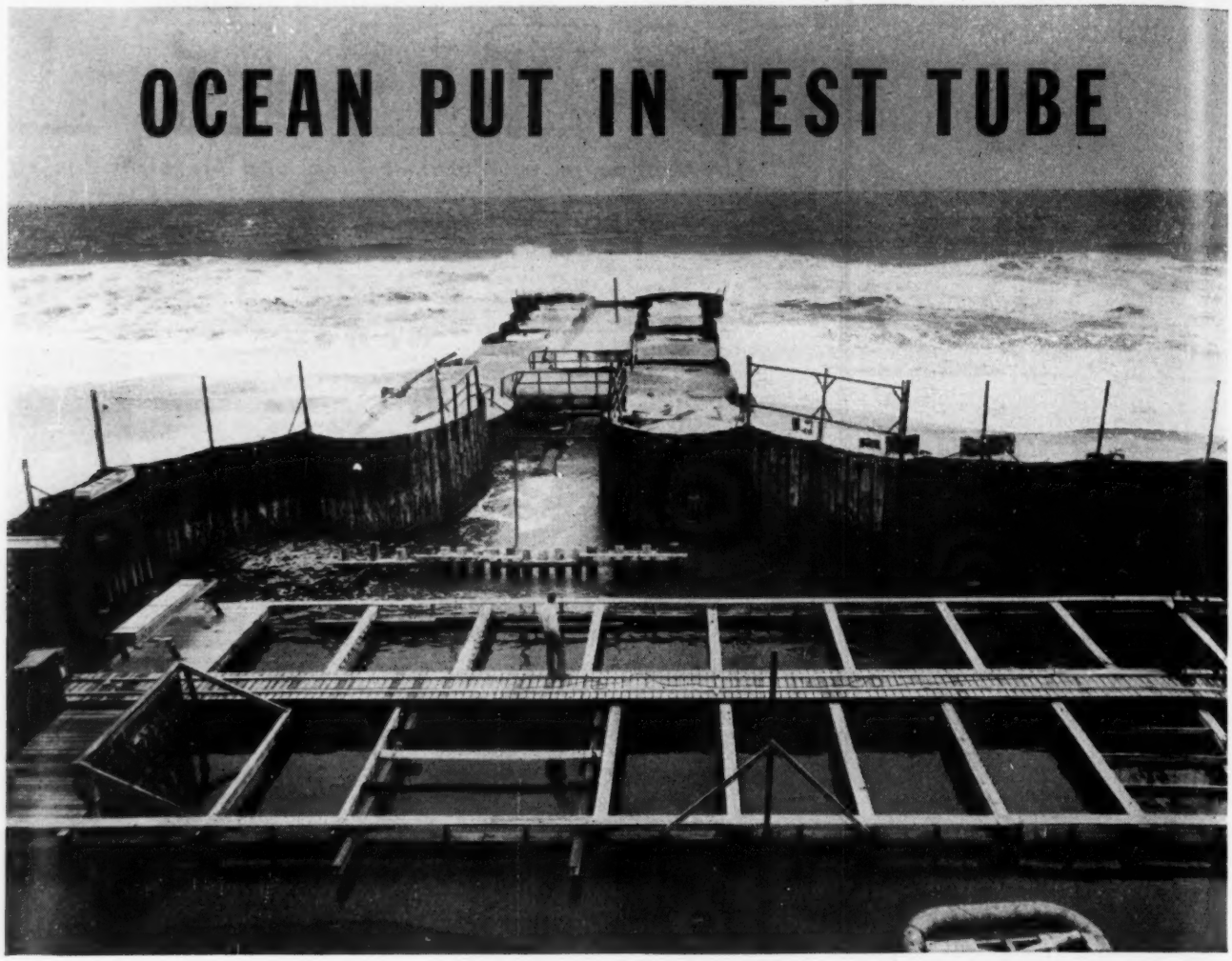
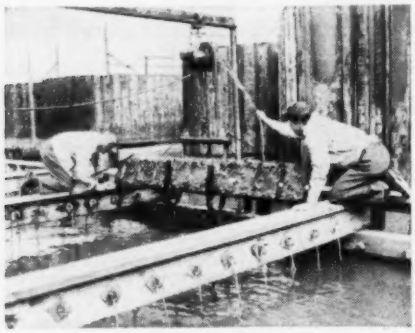
OCEAN PUT IN TEST TUBE



Tides and Waves Harnessed for Corrosion Data to Provide Better Materials for Industry...

INCO goes down to the sea...to get the ocean's own verdict on metals and alloys.

Here, at Kure Beach, the Atlantic has been made a giant test tube for studying the corrosive attack of salt water and salt air.



Raising a specimen rack at the site. Specimens are given detailed examination in the control laboratory.

Many different tests are made on thousands of metal specimens. Each is carried out under natural conditions expected in service.

The picture above shows the testing basin where metal panels are immersed in the ocean's own brine. This type of test shows how well the metal resists corrosion, and also whether it retards the growth of barnacles and other marine life.

In other tests, metals are exposed on racks to salt air and salt spray, or whirled through the water at high velocity.

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May 31, 1948

Hard Working Institute

Among those who attended the 56th general meeting of the American Iron & Steel Institute last week were many whose experience with institute meetings goes back 25 or 30 years. The 1948 event must have impressed them with the progress the organization has made since its early days.

In the teens and twenties, the institute held a session in the morning and a banquet in the evening. Judge E. H. Gary, principal speaker at the morning session, presented a statesmanlike discussion of major problems confronting the industry. His address was followed by four or five technical papers, each accompanied by one or two discussions—selected and prepared in advance.

A distinguished guest usually was principal speaker at the banquet. Following his address, Judge Gary called upon Willis King, "Uncle Joe" Butler and other "elder statesmen" for "impromptu" remarks. After they had responded with talks that seldom were impromptu, the meeting drew to a climactic close with an extemporaneous speech by the inimitable Charles M. Schwab.

Last week's Wednesday morning session opened with the excellent Charles M. Schwab Memorial Lecture by Charles F. Kettering. In the afternoon 18 papers were presented at six simultaneous technical sessions and scores of practical operating and technical men engaged in spontaneous discussion of them.

Thursday Walter S. Tower, president of the institute, presented an able report on the condition of the industry, with carefully balanced emphasis upon its major problems. David F. Austin and Dr. Claude Robinson presented detailed information on timely subjects. An industrial relations session in the afternoon was followed by the traditional banquet in the evening.

Comparing the 1948 meeting with those of earlier days, the chief difference is that the institute has become more democratic and more realistic. Then members came to listen to a few; today scores participate and there is more spontaneity. Then discussion was broad and general; today it is specific and much more comprehensive and penetrating.

If one were to compare the day-to-day chores of the institute with those of the earlier period, the contrast would be even more impressive. Today the institute is performing many services not even contemplated then. Its work has grown in scope and effectiveness. It is a credit to the enterprising industry it serves.

* * *

PROFIT NO CRITERION: In current wage disputes, union leaders are attempting to justify demands for substantial pay increases and liberal provision for social security on the ground that employers are making excessive profits and therefore can well afford to grant the requests. Spokesmen for the steelworkers, autoworkers, electrical workers, coal miners and others are placing heavy emphasis upon "ability to pay."

Apparently unionists believe this argument is more plausible than the plea that higher wages are required to offset higher living costs. Statistics showing that wages for most jobs have advanced more than living costs have weakened the latter claim, whereas high current corporation profits seem to lend weight to the "ability to pay" contention.

High profits do not tell the whole story of ability to pay. Jackson Martindell, president of Fiduciary Counsel Inc., speaking to a local chapter of Controllers Institute of America on the subject "Is Business Running Out of Cash?" presented figures showing that the ratio of quick cash assets to current liabilities of 50 leading industrial corporations dropped substantially

(OVER)

from 1930 to 1947 and alarmingly from 1946 to 1947.

Using universally accepted government figures, Ernest L. Klein, public relations counsel, Chicago, has computed comparisons showing that the actual purchasing power of corporate dividends in 1947 was 9.18 per cent less than in 1929, whereas the purchasing power of wages and salaries in 1947 was 81 per cent higher than in 1929.

High profits at a given moment do not constitute a fair basis for determining wages. —p. 30

* * *

LABOR PEACE FOR GM: Agreement by General Motors and United Autoworkers on a two-year contract will go a long way toward clearing the atmosphere in third-round wage disputes.

At first glance the 11-cents per hour adjustment may have appeared to some employers as being more liberal than circumstances demanded. However, this initial view is tempered considerably by a reading of the full agreement. The fact that labor peace between the world's largest automobile manufacturer and its employees is assured for two years and that the wage scale is tied to living costs may outweigh in importance the advance in the hourly rate. Another factor that should not be overlooked is the placating tone of the 2500-word agreement issued by General Motors which summarizes its labor relations policies affecting this settlement.

To what extent the General Motors pact will become a pattern for other settlements remains to be seen. —pp. 30, 41

* * *

MORE STEEL PRICES: Apparently some steel sellers, stirred by recent court decisions on basing points, are getting set for any eventuality. Two steel company respondents in the Federal Trade Commission's attack on steel pricing have asked FTC trial attorney Lynn C. Paulson what would be his recommendation if the commission were now in the process of deciding the action in the light of evidence so far taken. These requests suggest that these respondents may be considering changes in their price policies. Several small steel companies already are quoting on a strict f.o.b. mill basis. It is rumored that one large producer is planning to adopt mill prices by June 30. These straws in the wind point to an even more confusing price structure than that resulting from the recent anti-inflation price cuts. Consumers now face a multitude of direct mill prices as well as wide variations in basing point quotations. Theoretically this would seem to give buyers attractive opportunities to "shop around." Actually the scarcity of supply largely nullifies this option. —p. 32

* * *

DIFFICULT DECISIONS: Typical of the kind of difficult decision which has to be made in allocating tonnage when steel is scarce is that involved in the resubmitted request to the steel producers industry advisory committee for 58,000 tons of steel for use experimentally to develop all-steel prefabricated houses that will win public and government approval.

Against the desirability of speeding progress in the evolution of prefabricated homes is the practical consideration that 58,000 tons of steel could be used more effectively in houses of orthodox design or in products for which there is immediate demand. It is a question of utilizing scarce steel to create a new demand for steel or to fill an urgent need that already exists.

If steel were being allocated on a mandatory basis, questions of this kind would arise even more frequently. —p. 38

* * *

USE MORE STAINLESS: Visitors to last week's meeting of the American Iron & Steel Institute who inspected the Institute's stainless steel exhibit at 101 Park Ave., New York, saw impressive evidence of the progress made in the application of this type of alloy during recent years.

Stainless steel output has increased from 42,000 tons in 1929 to more than 500,000 tons in 1947. Today the 30 steels in the stainless family find application in more than 100,000 items. The largest users of stainless in order of tonnage consumed are the automotive, household appliance, container and food and beverage processing industries.

In 1947 there were about 5000 jobbing fabricators of stainless steel in the United States and approximately 10,000 manufacturers who use stainless in their products. Diversification of application continues steadily as new uses are developed. —p. 44

E. L. Shaner

EDITOR-IN-CHIEF

News Summary

WAGES— General Motors' announcement of an 11-cent wage increase to its 225,000 production workers and the gearing of future wage rates to the cost of living dropped like a bombshell (pp. 30, 41) among other metalworking companies. Its impact on wage negotiations under way and those soon to start will be heavy. The GM settlement may force reconsideration of agreements already signed. In some metalworking quarters, the GM announcement was received bitterly by executives who believe it may nullify the anti-inflation program of the basic steel and electrical manufacturing industries. They fear hitching wages to the living cost index will continue the inflationary spiral, with the latest wage increase boosting the cost of living, which in turn will necessitate another wage increase in September, which in turn will nudge living costs upward.

PRICING— Legislation to clarify the status of pricing methods and to prevent threatened chaotic effects of the Supreme Court decision outlawing the basing point system was called for at the 56th general meeting of the American Iron & Steel Institute (p.27). Meanwhile steelmakers are giving thought (p.32) to their pricing policies in event the government decrees the present system be abandoned. Several small companies are quoting f.o.b. mill.

ALLOCATIONS— Voluntary system of allocating steel is fair, practical and wholly adequate, AISI members were assured by David F. Austin, who estimates the total dislocation of steel over the next 12 months at 4 million tons (p. 27). Nine voluntary programs, in addition to freight cars, are expected (p. 38) to be put into effect soon. The industry advisory committee has approved 160,000 tons for the Atomic Energy Commission, 212,000 tons for domestic heating equipment, but questions a proposed allocation for prefabricated housing.

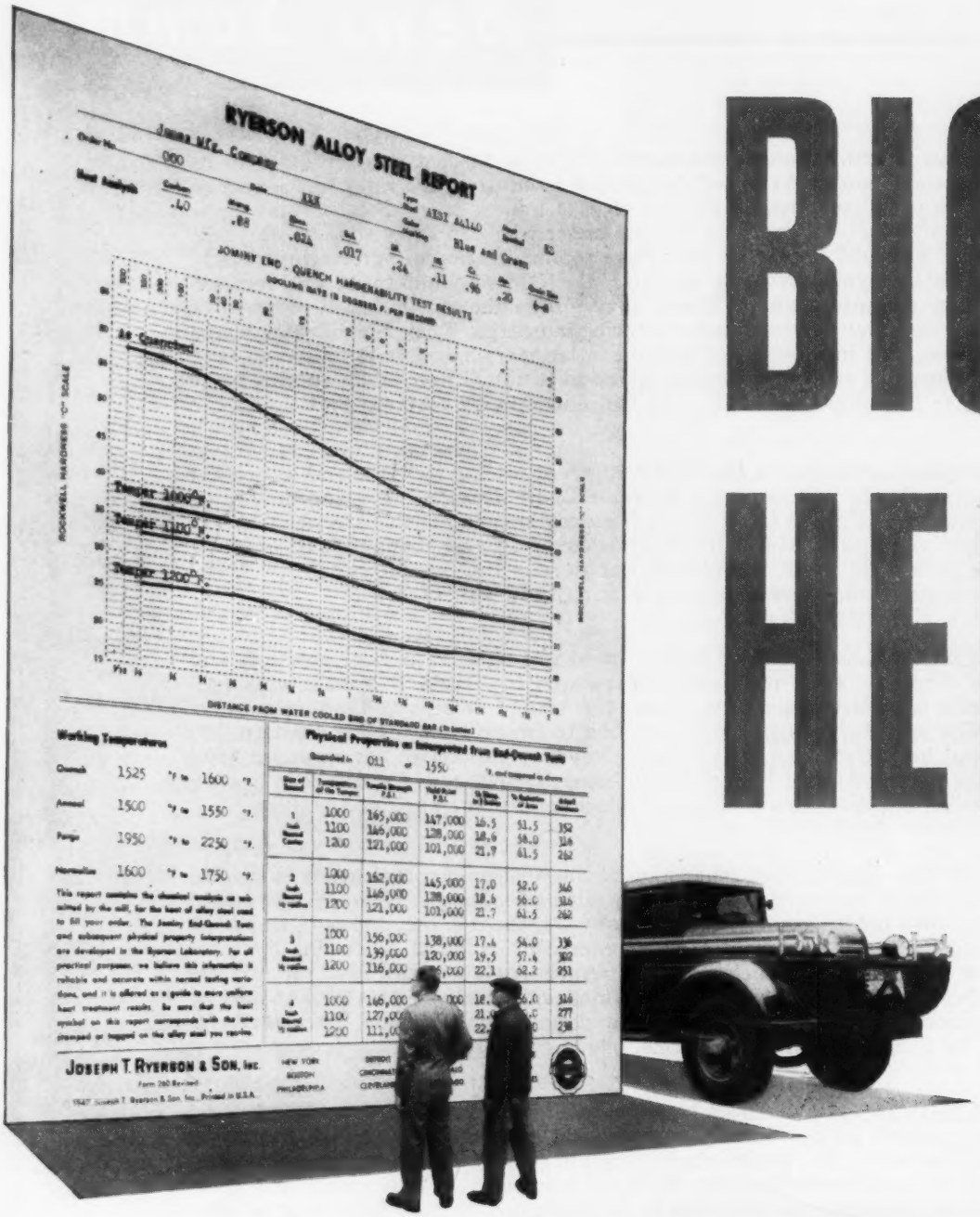
TACONITE—Approaching exhaustion of the high-grade ore deposits in the upper lakes region has worried steel and metalworking men for years. Where would industry turn for its ferrous raw material when the rich ores ran out? One hope has been for the development of an economical method of processing the iron-bearing rock, taconite, which exists in tremendous quantities near the rich ore beds. Several companies have been working intensively on this project and by midsummer, Erie Mining Co. will begin shipments of taconite concentrate (p. 33) to be used in the furnaces of steel plants co-operating in the project.

PREPAREDNESS—Conferences between the Munitions Board and industrial groups on needs for possible war emergencies are producing beneficial results for industry as well as the preparedness program (p. 34). As result of recommendations by the nonferrous industry, the board is considering broadening the specifications for minerals and materials to be stockpiled, thereby increasing production both for stockpiling and current consumption.

STAINLESS STEEL—An exhibit just opened in New York demonstrates the development and acceptance of stainless steel (p. 44). Production of stainless has increased from 42,000 tons in 1929 to more than 500,000 tons last year. About 10,000 industrial companies use this alloy in their products.

SIGNS OF THE TIMES—Proposal to build a canal connecting the Ohio River and Lake Erie, affording water transportation to metalworking and steel mills in the rich Mahoning Valley (p. 33) is being revived. . . German industrialists complain output of steel is being retarded by scarcities of ore, scrap, coal and power (p.39) rather than by willful production curtailments . . . Steel shortages (p. 37) continue the greatest obstacle to full production in a variety of West Coast metalworking plants. . . Changes in the Taft-Hartley Act are being considered in Congress (p. 36). . . The greatest electric power expansion program in history (p. 36) is expected to alleviate the extremely tight power situation. . . Production, with the exception of automobiles, is climbing back (p. 46) to near pre-coal strike levels. . . Navy requirements for steel in 1949 are estimated (p. 31) at slightly more than a half million tons. . . Domestic sales of machine tools (p. 31) are higher.

Engineering News, P. 55 *Market Summary, P. 103*



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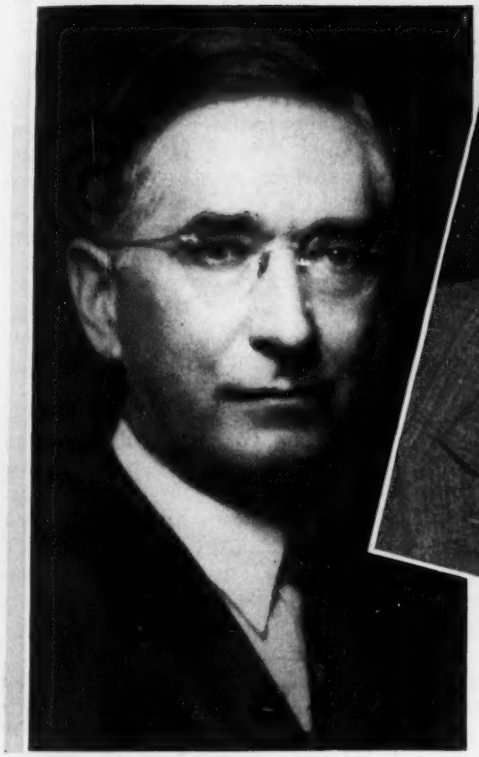
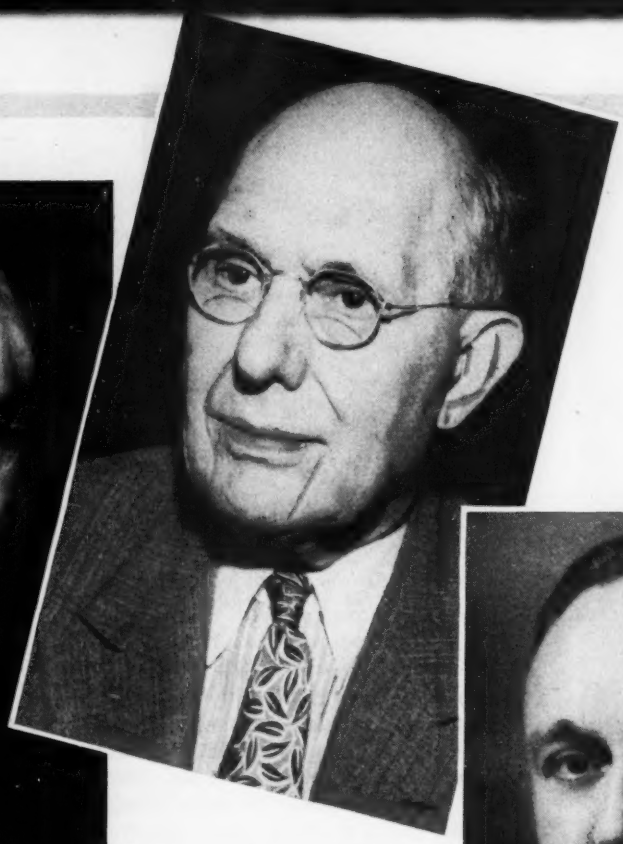


WALTER S. TOWER
President of AISI and speaker at general session



CHARLES F. KETTERING
Vice president, General Motors Corp., and Charles M. Schwab memorial lecturer

DAVID F. AUSTIN
Vice president, United States Steel Corp., and speaker at general session

Steel Men Ask Pricing System Clarification by Law

Legislative action deemed necessary to avert threatened chaos resulting from Supreme Court decision in Cement case. AISI members told voluntary allocation controls adequate

LEGISLATIVE clarification of the status of pricing methods is imperative if the disruptive effects threatened by the recent Supreme Court decision outlawing basing points are to be prevented.

This warning was sounded at the 56th general meeting of the American Iron & Steel Institute, May 26-27, in New York by Walter S. Tower, institute president.

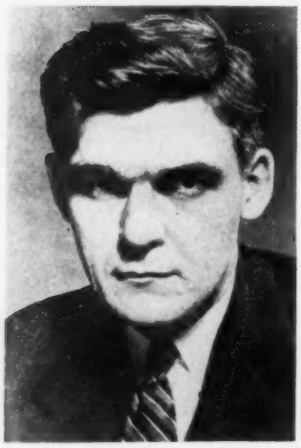
At the same session, some 1200 steel men were told by David F. Austin, vice president, United States Steel Corp., that there is no necessity for enactment of legislation to return the economy to a controlled basis. Mr. Austin pointed out that voluntary methods of allocating steel are essentially fair and practical and wholly adequate.

Mr. Tower said that general application of the Supreme Court decision outlawing basing points in the cement industry threatens to destroy close and satisfactory commercial relationships which have come about through several decades between steel producers and users and between manufacturing plants and the markets.

Encourages Competition — The basing point method of quoting prices facilitates and encourages competition in widespread markets, Mr. Tower asserted. Many of the larger steel consuming industries, which have grown from their initial, small statures during the period when steel has been sold on the basing point method of pricing, now depend on hundreds of widely scattered parts plants, he pointed out. If steel products are required to be sold on an f.o.b. mill basis, widely scattered buyers of steel products will be penalized in direct proportion to their distance from a steel producing point, he said. Local monopolies will be created around each steel mill, he added.

Few of the products which are now such large factors in comfortable

REP. CHARLES HALLECK
Speaker at AISI dinner



SEN. JOSEPH H. BALL
Speaker at Industrial Relations session

DR. CLAUDE ROBINSON
President, Opinion Research Corp., speaker at general session

living are made at basing points for steel products or even close to steel mills, said Mr. Tower. Less than half of the autos come out of Detroit assembly plants, most of the widely known refrigerators come from places which make no steel, and much the same is true for other consumer durable goods, he explained.

This is not the place to try to appraise all the ultimate effects of the strange concept of prices which seems to be inherent in the cement case decision, but it is hard to figure how any effects which are bound to be harmful to this industry and to the users of its products can be helpful to the general economy of the country, Mr. Tower said.

Cites Strike Loss—Mr. Tower hit at "relentless planners who seek powers to dictate to industry." He asserted that labor leaders' demand for ten million tons more of ingot capacity overlook the fact that there could have been 20 million more tons of steel during the past 30 months had production not suffered from strikes and work stoppages directed by some of these same union leaders.

To help make effective the anti-inflation moves recently announced by steel companies, the support of similar action by other important industries is needed, said Mr. Tower.

"But the power to stop inflation does not rest solely, even mainly, in the hand of industry," he added. "Far greater is the force of government policy in its attitude toward the demands of organized labor and in its disposition to restrain the ever-growing pressures for more and more federal spending."

Voluntary Program Adequate—Mr. Austin said the steel industry already has recommended to Secretary of Commerce Sawyer that the steel division be enlarged to a size adequate to take care of all programs, that it be staffed by experienced personnel, that necessary legal clearances be obtained, and that a screening committee be established to pass on the validity of the claims for special help.

A multiplicity of departmental procedures and of steel allocating units within the government must be avoided if the steel needs of essential programs are to be met and other consumers served equitably, said Mr. Austin.

Another essential, he said, is the establishment of a single, qualified group capable of studying, screening, authenticating and certifying the request of each claimant for steel, including the claims of governmental departments.

Problem Complicated — "The problem which the steel industry faces today is no longer confined to domestic and normal export requirements—it has become far more complicated," said Mr. Austin. "We have temporarily become the steel source for the whole peace-seeking world, just as during the war the United States became the arsenal of the Allies."

Foresees 4-Million-Ton Dislocation—A total foreseeable dislocation of approximately 4 million tons of steel is indicated over the next 12 months by comparing the total amounts of steel required for essential steel consuming programs which already have appeared or are likely to make an early appearance with the tonnages currently flowing to the same end uses, said Mr. Austin. The programs include the ERP export program, exports to countries *other* than those qualifying under the ERP, the needs of the Army, Navy and Maritime Commission, the freight car construction program, the oil and gas program, atomic energy projects and housing.

"The steel industry long since expressed its complete willingness to attack this problem," said Mr. Austin. "It awaits no further word than that the programs are authentic and essential."

Advocates Local Bargaining—Sen. Joseph H. Ball (Rep., Minn.) told the industrial relations session that in most labor disputes the public interest demands prohibition or restriction of industry-wide bargaining and that unions and employers should bargain on a local basis.

"If we permit unrestricted industry-wide bargaining, then industry-wide strikes are inevitable. Bargaining is not free if the bargainers are compelled by law to reach agreement."

Research in Bargaining—For the first time research has become a factor in collective bargaining, Charles F. Kettering, vice president and director of research, General Motors Corp., told delegates. He was referring to the recent General Motors wage settlement, pointing out that it was now up to research specialists and the engineers to develop ways and means of absorbing the added costs that may result from periodic upward wage adjustments.

His comment came in the course of his general address on the subject of research in industry delivered as the second Schwab Memorial Lecture at the opening session of the convention. The price of progress is trouble, he said, and failure is a stepping stone to success. Mr.

TECHNICAL PAPERS

Abstracts of the technical papers presented at the 56th general meeting of the American Iron & Steel Institute are published in this issue, starting on page 68.

Schwab, he recalled, never feared failure and was always willing and eager to attempt a new venture up the road.

Commenting on the future, Mr. Kettering decried a disposition to look for a leveling off in research, or, for that matter, in other activities including operations. There are two approaches to research, he said, academic and practical. One is the prospector type, the other the miner type, one looks for things, the other actually develops them.

Mr. Kettering emphasized the need for educating the public with respect to the steel industry. People do not know the difference between steel and iron, and should be told. He paid tribute to the development work in steel and remarked that the automotive industry, as a large consumer of steel, believed that, despite criticism to the contrary, the steel industry has never held back on its research findings because of the possible necessity for changing equipment. Steel did a marvelous job during the war in shifting from production for peacetime to production for war.

He concluded by saying that research must be promoted years ahead of the actual time a product comes into use, that today is the age of opportunities unlimited, and that human progress is not static.

Need Public's Favor — Favorable public opinion has become almost as important to industry today as good sources of raw materials and efficient manufacturing and marketing methods, Dr. Claude S. Robinson, president, Opinion Research Corp., Princeton, N. J., said, addressing a meeting at the Thursday morning session. He predicted that business men will spend more time, energy, money and imagination on public relations in the future than in the past, and better integration of public relations planning with business policy.

Speaker at the annual dinner, held at the Waldorf-Astoria, was Rep. Charles A. Halleck (Rep., Ind.).

A feature of the meeting was the showing of the picturama, "The New America," offering a provocative appraisal of the United States economy, its industrial capacity and its guiding spirit.

Three men were awarded the American Iron & Steel Institute Medal. One was awarded posthumously.

J. L. Mauthe, vice president, Youngstown Sheet & Tube Co., and Karl L. Fetters, special metallurgist, Youngstown Sheet & Tube Co., were honored for their technical paper presented at the institute meeting in 1947, titled "The Mineralogy of Basic Open Hearth Slags."

Award for the third winner, the late J. H. Slater, who was assistant district manager, Cleveland district, Republic Steel Corp., at the time of his death, was received by his son, Joseph L. Slater, New York.

Mr. Slater's medal-winning paper, presented at the institute meeting in 1947, was titled "Operation of the Iron Blast Furnace at High Pressure."

E. M. RICHARDS

Vice president, Republic Steel Corp., chairman of Sources of Iron session

S. J. CORT

Vice president, Bethlehem Steel Co., chairman of Oxygen in Steelmaking session

F. H. FANNING

Assistant vice president, Armco Steel Corp., chairman of Coating and Finishing session

J. E. LOSE

Vice president, Carnegie-Illinois Steel Corp., chairman of Refractories session

J. B. MITCHELL

Vice president, Jones & Laughlin Steel Corp., chairman of Coal and Coke session

F. B. LOUNSBERRY

Vice president, Allegheny Ludlum Steel Corp., chairman of Specialty Steels session

GM Hitches Wages to Living Costs

Grants 11-cents hourly increase. Annual improvement factor included in two-year year contract. Settlement surprises and disappoints companies backing no-wage-increase program

Top negotiators in the General Motors wage conferences are shown here as they announced an agreement which hitches wages to the cost-of-living index. Left to right: John W. Livingston, UAW vice president; T. A. Johnstone, assistant director of the GM department of UAW; Harry W. Anderson, GM vice president and director of personnel; Louis Seaton, GM director of labor relations. Acme telephoto

INDUSTRY'S attempt to halt inflation by withholding third round wage increases and by reducing prices on its products was rocked and possibly scuttled by the wage increase granted to 225,000 General Motors employees last week. The agreement between GM and UAW-CIO provides for an immediate 11-cents-an-hour wage increase and contains an escalator clause hitching future wage rates to the cost-of-living index.

Immediate reaction among other metalworking companies, particularly those backing the no-wage-increase, lower-prices program, was one of surprise and disappointment. Consensus is that pressure for third round increases would be intensified by the unions and that some companies which said "no" to the unions' demands earlier this year might be forced to reconsider.

Metalworking companies generally admit that the GM settlement would exert a powerful influence on wage negotiations now under way or soon to be undertaken. They believe the increase granted by the largest automaker may nullify the resistance to wage increases already demonstrated by the basic steel industry and by the big electrical manufacturing companies.

Some Applaud—The GM settlement attracted some cheers. It was applauded by labor union leaders and by mediation and conciliation men in government service. Said Cyrus Ching, federal conciliation director: "It's a long step toward establishing a pattern" for settlements throughout the other big industries.

Under the agreement, which runs for two years, GM production workers are granted an 11-cent raise immediately, of which 8 cents is a cost of living adjustment and 3 cents is an "annual improvement factor to increase the standard of living for workmen."

Under the cost-of-living adjustment, based on the Bureau of Labor Statistics index, quarterly adjustments to bring wage rates in line with the changes in living costs will be made. Wages will rise 1 cent per hour for each 1.14 points advance in the BLS index. Likewise, they can be cut 1 cent for each 1.14 points decrease in the BLS index, but the drop is limited to 5 cents an hour during the life of the contract.

One year from now, GM will automatically grant another 3 cent per hour "annual improvement factor" raise.

Fear Accelerating Inflation—Critics of the GM settlement believe the gearing of wage increases to the cost-of-living index may provide a self-feeding inflationary spiral. An 11-cent increase now, provided the GM pattern is followed by a large portion of industry, is likely to cause further increases in prices and the cost-of-living index. This would necessitate a new round of wage increases at the next quarterly adjustment period, in September. The new wage increases logically might be expected to cause further increases in prices and a further advance in the BLS index, calling for more wage increases. Where, they ask, is it all going to stop?

On the favorable side, the same critics admit that the agreement should go far in assuring two strike-free years, during which comparatively full production might eliminate some present scarcities and remove the deficit of goods, particularly automobiles, which has been encouraging inflationary prices.

The 3-cents-an-hour annual improvement factor, considered alone, is considerably less than the average annual increase won by organized labor since the end of the war.

The first round of postwar wage increases, granted in early 1946, centered around 18½ cents an hour. The second round, in 1947, averaged about 15 cents, and included numerous fringe concessions.

Some third round wage increases had been granted prior to the GM settlement, but these varied so widely as to make determination of a pattern difficult. One national survey places the average at 7 cents an hour, with advances ranging up to 35 cents an hour. These high increases were offset by outright refusals of any increase in such major industries as steel and electrical manufacturing.

Increases Wage Pressure—The GM contract is believed certain to increase union pressure for wage increases from other auto companies and in other industries. GM offered the same settlement to its electrical workers and the UE will use this as a lever against General Electric, Westinghouse and others.

Legally, the basic steel industry's contracts are closed until next April and cannot be reopened by the union for further wage negotiations. However, in announcing U. S. Steel's refusal to grant a wage increase this year, President Ben Fairless said:

"If costs should continue to advance, then in fairness to our employees and to our stockholders we will have to consider at some later date the adequacy of both wages and steel prices under the existing conditions." This leaves the door open for possible steel wage adjustments later this year should conditions warrant.

Contracts of most nonbasic steel companies expire during 1948 and the United Steelworkers will press for wage increases from these companies. Some contracts already have been renewed, with modest wage advances frequently granted.

Other metalworking companies unionized by various CIO, AFL and independent unions likewise will feel the increased pressure for boosts in wages.

Aviation, Tool and Gage Men Set for Emergency

U. S. industrial preparedness in three important, related industries—aviation, machine tools and gage manufacture and development—has reached an advanced stage of planning, according to discussions at a recent meeting of the American Ordnance Association held in co-operation with the New York University College of Engineering.

With more than 250 industrialists, scientists and representatives of the military departments present, speakers advised that through experience gained in the last war mobilization of industry could be achieved much faster in event of another emergency. Capt. M. C. McQuiston, chief of naval inspection, New York district, asserted that "the attendance here shows that industry is taking the initiative, instead of waiting for the government signal."

Five-Year Plan—The preparedness programs, as explained at the meeting, cover a five-year period, with machine tool and gage manufacturers dependent in their planning upon the size and scope of the aviation industry's expansion. This proposed expansion, described by Captain McQuiston as "the greatest peacetime building program ever undertaken," will call for more than 250,000 machine tools, in the opinion of other speakers. Without any increase in demand for tools by other industries during these five years, they said, the aviation industry's requirements will add 100 per cent to the output quotas of machine tool builders, based on their 1947 production.

William Gourlie, Sheffield Corp., Dayton, O., described production time savings made possible since the beginning of World War II by multiple gaging methods and by use of automatic electrical and air-operated tools.

Conferences which have been held by various groups within the industries and by individual companies to crystallize mobilization plans were reported on by several other speakers at the meeting.

NMTBA Says Shipments, Domestic Tool Sales Up

A pick-up in new domestic machine tool orders in April was indicated by the National Machine Tool Builders' Association's index, but lower volume of foreign ordering maintained the index at 86.3 per cent of 1945-47 shipments.

Now basing its index of both shipments and orders on the last three years' shipment volume, the association believes its figures reflect more accurately the unit volume of the industry's activity and eliminate distortions previously resulting from price increases on identical tools and on more productive new models.

Shipments in March, as determined by a centered three months' average, were 84.2 per cent of the base, up 2.3 points from the previous month.

Atomic Commission Opens Ames, Iowa, Lab

United States Atomic Energy Commission recently opened a new metallurgical laboratory at Iowa State College, Ames, Iowa, as part of a $3 million construction and expansion program.

Also included in the program will be a new research building, to be erected at a cost of $1,500,000, with an additional $350,000 for equipment. It will be a four-story structure 240 by 60 feet, with a two-story wing 120 by 40 feet. When both buildings are completed, most of the various phases of the commission's program will be consolidated at this facility, now designated Ames Laboratory of the U. S. Atomic Energy Commission, with the purpose of increasing research operations and stepping up the training of young scientists for atomic energy fields.

Present, Past and Pending

■ NAVY'S 1949 STEEL NEEDS ARE 510,765 TONS
WASHINGTON—Navy requirements of finished rolled steel products in the fiscal year ending June 30, 1949, will be 510,765 net tons, according to estimates by the department. These include 127,912 tons to be procured directly by the Navy and 382,853 tons by contractors.

■ WESTINGHOUSE TO EXPAND TRANSFORMER PLANT
SHARON, PA.—Westinghouse Electric Corp. plans construction of a 92,000 sq ft addition to its local transformer division plant. Steel tanks for transformers will be built in the facility.

■ MANY SEARS, ROEBUCK PRODUCTS' PRICES CUT
CHICAGO—Sears, Roebuck & Co.'s midsummer catalog shows reduced prices on tires, housewares, sporting goods, power tools, hardware and plumbing needs, electrical appliances, farm and garden equipment and other seasonal items.

■ WISCONSIN AXLE CLOSES WAUKEGAN FACILITY
OSHKOSH, WIS.—Wisconsin Axle Division, Timken-Detroit Axle Corp., has closed its Waukegan, Ill., heavy-duty truck axle and brake plant and will concentrate axle production in Oshkosh and Detroit and brake output at a newly acquired plant in Ashtabula, O.

■ BORG-WARNER LEASES DECATUR PLANT
CHICAGO—Plant No. 3 of Mueller Co., Decatur, Ill., containing approximately 135,000 sq ft, has been leased by Borg-Warner Corp. Products to be manufactured there have not been announced.

■ STERLING TO RESUME DIESEL PRODUCTION
BUFFALO—Agreement from creditors to hold in abeyance until Nov. 15 a bankruptcy petition has prompted Sterling Engine Co., now in receivership, to recall 150 employees and to resume production.

■ LLOYD STEEL'S FURNACE TO START OPERATION
PITTSBURGH—Lloyd Steel Co., lessee of the former 25-ton acid open-hearth furnace owned by National Roll & Foundry Co., at Avonmore, Pa., has converted it into a 35-ton basic open hearth and expects to begin its operation this week. Monthly output, already contracted for, will be about 3000 tons.

Steel Pricing Problem Studied

Producers are preparing for revolutionary marketing change in event they are forced to abandon present basing point system. Cease and desist order expected

FATE of the steel industry's basing point pricing system hangs in the balance but signs are accumulating to indicate the steel companies are getting prepared for any eventuality.

As a matter of fact, several of the smaller companies within recent weeks have gone on a strict f.o.b. mill basis of quoting, and rumors are circulating in the trade to the effect one of the larger producing interests is planning to adopt f.o.b. mill pricing by June 30.

Just how much credence should be attached to the latter rumor is uncertain. It is known, however, that the commercial research and traffic departments of the steel producers are busy studying the problem which would be posed by abandonment of basing point pricing.

Ask FTC View—Attorneys for two steel company respondents in the Federal Trade Commission's current attack on steel pricing, in written requests, recently asked FTC Trial Attorney Lynn C. Paulson what his recommendations would be to the commission in event the commission were now in the process of deciding the action in the light of evidence so far taken. These requests would seem to hint that at least two steel companies are in the process of shaping new price policies.

Answering the attorneys' requests, Mr. Paulson said that, subject to revisions which may be suggested by future developments, he now would recommend a commission order calling upon the steel industry to abandon the present pricing system entirely. Instead, every plant should have an f.o.b. mill price on every product which it sells, and it should be willing to sell at that price when consumers make such request.

No Flat Price—Mr. Paulson, however, does not seek to compel a producer to sell at a flat mill price. Rather, he would permit variations in the mill price to permit the mill to absorb freight in order to meet competitors' delivered prices. He warns, though, that must be done "in good faith," and to meet competition in individual instances. It must not be done in conformity with any pricing policy of the industry in general or of a competitor. On this point, if Mr. Paulson were to argue his case before the commission today, he would take the position that variations in mill prices to meet competition are to be encouraged since they benefit consumers.

Also, if Mr. Paulson were submitting his recommendations to the commission at this time, he would call for an end to all "collusive" practices in pricing generally. This applies to the establishment of extras, the determination of terms and conditions of sale, such as cash discounts to jobbers, the adoption of mill prices named by a price "leader," and the compilation of the freight rate books published by the American Iron & Steel Institute.

SENATE PROBE

Senate investigation into the effect of the Supreme Court's recent cement basing point decision on consumers of goods and on small and large business is proposed by Senator Homer E. Capehart (Rep., Ind.) in bill, S. Res. 241.

Hearings open June 2 by a Senate Commerce subcommittee to consider the resolution. The five members of the Federal Trade Commission have been invited to appear as witnesses, and representatives of industry, business and consumer groups will be asked to testify. In addition to Senator Capehart the Senate subcommittee is composed of Senators Hawkes, Brewster, Johnson and McMahon.

Not Final Position—Mr. Paulson explained that his reply is predicated on the evidence he has accumulated to date, and its relation to the Supreme Court decision in the cement and glucose cases. At the same time, he explained his present position cannot be taken as final.

See Cease and Desist Order—On the basis of opinions expressed by Federal Trade commissioners and staff members, there is little doubt but that if the steel case now were at the stage of being ready for final action, the commission would issue a cease-and-desist order incorporating Mr. Paulson's recommendations as set forth above. The commission's confidence in its present legal philosophy has been further strengthened by the recent decision of the Seventh Circuit Court of Appeals (Chicago) in the Rigid Steel Conduit case. The Chicago court's decision, the first by a lower court since the Supreme Court's cement decision, again outlawed the arrangement known as "a basing-point system of delivered prices by individual companies."

The commission's comment on the Rigid Steel Conduit decision in part follows:

"Use of a basing-point system of delivered prices by individual companies, engaged in the production and sale of rigid steel conduit, with knowledge that other sellers are using the same pricing methods and with the result that price competition is unreasonably restrained, constitutes an 'unfair method of competition' in violation of the Federal Trade Commission Act irrespective of any combination or conspiracy."

Follows Supreme Court — "The Court held in effect that, in the light of the recent decision of the Supreme Court of the United States in the Cement Institute case, the Commission may properly prohibit as an unfair method of competition individual conduct which falls short of being a Sherman Act violation.

"The Court said: 'Each conduit seller knows that each of the other sellers is using the basing point formula; each knows that by using it he will be able to quote identical delivered prices and thus present a condition of matched prices under which purchasers are isolated and deprived of choice among sellers so far as price advantage is concerned. Each seller must systematically increase or decrease his mill net price for customers at numerous destinations in order to match the delivered prices of his competitors. Each seller consciously intends not to attempt the exclusion of any competition from his natural freight advantage territory by reducing the price, and in effect invites the others to share the available business at matched prices in his natural market in return for a reciprocal invitation."

Cement Firms Ask for Price Clarification

The Supreme Court has been asked to tell the cement industry exactly what pricing systems are legal. Three cement firms last week filed petitions technically for a rehearing of the Court's ruling upholding the Federal Trade Commission's anti-trust suit against the industry. Two of the

petitions concentrated on reasons why California Portland Cement Co. and Northwestern Portland Cement Co. should not have been found part of the conspiracy. The third petition, filed by Superior Portland Cement Co., asked the Court to say what pricing systems cement firms could now use.

The Court on Apr. 26 found the cement firms guilty of a conspiracy to use a multiple basing point delivered price system. This, the Court said, was illegal and the entire basing point system constituted unfair competition and price discrimination under the anti-trust laws. The decision has been cause for great concern in the cement industry, among steel producers and other heavy goods industries.

West Coast Auto Parts Supplier Expands Plants

United States Spring & Bumper Co., Los Angeles, recently held an open house to mark the move of its service division to enlarged quarters at 3225 E. Washington Blvd., Los Angeles. The shift is part of a company-wide, $1 million expansion and modernization program.

The service division is located on a two and one-half acre tract on which are situated two factory buildings, an office structure and a service building 210 feet long. All equipment here is new and includes furnaces, shears, eye machines, presses, frame straightening and wheel aligning devices. Cost of buildings and equipment, without the land, amounted to $400,000.

As part of another project, the company has leased an additional building on 37th St., together with presses, the largest of which has a capacity of 1750 tons. U. S. Spring & Bumper plans to add more equipment at this location, at a cost of $250,000. Here the firm will cold-form bumper bars and guards and will prepolish all bumper stock in the flat.

At its main plant the company recently built an additional warehouse and spur track and is also installing additional equipment, costing approximately $350,000, for the manufacture of coil springs for the front end of 1949 model cars.

U. S. Spring & Bumper started in 1929 to make parts as original equipment for automobiles and trucks assembled on the Pacific Coast. At the present time the firm is making parts for Buick, Chevrolet, Chevrolet Truck, Dodge, Dodge Truck, Ford, Ford Truck, Mercury, Lincoln, Plymouth, Pontiac and Studebaker.

May Ship Taconite in July

Erie Mining Co., subsidiary of Pickands Mather & Co., expects to complete pilot plant in another month. Concentrate will be about 65 per cent iron

TACONITE, one of industry's answers to the iron ore exhaustion problem, is expected to start flowing in July from Erie Mining Co.'s pilot plant at Aurora, Minn.

The last piece of needed equipment has arrived and only another month's work is reported required for putting this one and one-half million dollar plant into operation. None of the taconite from this plant will be for sale on the open market but will go to two or three steel companies which are financially associated in Erie Mining Co., a subsidiary of Pickands Mather & Co., Cleveland.

OHIO CANAL?

Proposal to build a 104-mile canal to connect Lake Erie and the Ohio River came into the news again last week when the Army's Ohio River division engineer announced approval of a review report on the project.

The proposed canal would be 18 feet deep, cost $439 million. Course would run from Rochester, Pa., on the Ohio through Beaver Falls and New Castle, Pa., Youngstown, Niles, Warren and Jefferson to Ashtabula, O.

Such a project, which has been under consideration for many years, would provide water transportation to Mahoning Valley steel mills and metalworking plants.

The pilot plant's maximum capacity is approximately 200,000 tons annually, sufficient for experiments designed to adapt blast furnace and open hearth practices to reduction of concentrates.

Containing approximately 65 per cent iron, Erie Mining Co.'s concentrate in its finished form is in balls of one-half-inch diameter.

The pilot plant will take Erie Mining Co.'s taconite experiments out of the limited confines of a laboratory and put them on a basis more comparable with full-scale, production-plant operations. Out of the pilot plant activities will come operating and cost data which will help determine whether a full-scale production plant should be built, and if so, how it should be equipped.

Deep Concern Indicated—Although much still remains to be learned about taconite and even though there is considerable difference of opinion how long direct shipping ores will last, the lengths to which Erie Mining Co. and others have gone in search for a supplement to the direct shipping ores indicates industry's deep concern over the ore supply.

With the opening of Erie Mining Co.'s pilot plant near, residents of Aurora, who with other Mesabi range residents have been concerned over their economic future, hail it with joy. Aurora residents wanted to have a celebration to signal the opening of the facility, but Erie Mining Co. convinced them a pilot plant did not warrant festivities.

In addition to the many experiments that must be made with taconite at concentration plants and at blast furnaces and steel plants are studies of taconite shipping problems. Erie Mining Co., for instance, is seeking to determine whether taconite concentrates in ball form will shift in cargo holds of the Great Lakes ships.

In addition to Erie Mining Co., in which Bethlehem Steel Co. and Youngstown Sheet & Tube Co. are associated with Pickands Mather & Co., other companies engaged in research on the technical and economic problems of concentrating the abundant iron-bearing rock (taconite) of the Lake Superior district include Oglebay-Norton & Co. through its Reserve Mining Co. in which Armco Steel Corp. and Wheeling Steel Corp. are associated; U. S. Steel Corp. through its Oliver Iron Mining Co.; Metals Separation Co. in conjunction with Cleveland-Cliffs Iron Co.; M. A. Hanna Co.; and Butler Bros.

McLouth Steel Corp. High Bidder for Plant

McLouth Steel Corp., Detroit, last week submitted the highest bid to War Assets Administration for purchase of the surplus electric furnace steel plant in East Chicago, Ind., operated during the war by Youngstown Sheet & Tube Co.

McLouth's bid was $1,207,327 and proposed to pay 20 per cent down. The plant has two furnaces, with annual capacity of 120,000 tons.

Windows of Washington

By E. C. KREUTZBERG *Washington Editor, STEEL*

Conferences between Munitions Board and industry representatives producing beneficial results for industry as well as aiding planning for future emergencies

THE Munitions Board has reached that stage of its planning activities where it is consulting with industry on the needs in possible war emergencies. Meetings already have been held with the nonferrous metals, machine tool and chemical industries and on June 3 will be held with the iron and steel industry.

These meetings are producing beneficial results for industry as well as for the Munitions Board. For example, as a result of a suggestion from nonferrous spokesmen, the board is considering broadening the specifications of minerals and metals acceptable for stockpiling. The industry view was that by making acceptable some of the materials that previously were not wanted, production will be increased not only for stockpiling but for general use.

The meeting with the machine tool people, May 25, was given over largely to "organizational" matters—as the possible selection of additional members to make the committee fully representative. Featuring the meeting was a report on the present machine tools inventory of the armed services, with some indication as to future needs.

The meeting with the iron and steel group on June 3 also will be of an organizational character. Plans for formation of a number of subcommittees will be discussed, and views will be requested as to whether there should be a separate advisory committee representing foundries. Most interesting point to be brought up will have to do with steel capacity; steel men will be asked to state their views as to whether in an emergency it would be better to restrict less essential uses of steel or set up a steel expansion program.

Enemy Industrial Secrets

How German and Japanese industrial secrets can be put to wider use by American industry is a problem posed to the Senate Committee on Interstate and Foreign Commerce. A huge mass of such data has been accumulated by the Office of Technical Services but, due to lack of sufficient funds, has not been widely exploited. Sen. Homer E. Capehart (Rep., Ind.) has introduced a bill calling for a report by the committee by Mar. 15, 1949.

Foster Joins ECA

William C. Foster, under secretary of commerce since 1946 and former president of the Pressed & Welded

WILLIAM C. FOSTER

Steel Products Co. Inc., Long Island City, N. Y., has been appointed deputy special representative in Europe of the Economic Co-operation Administration. Mr. Foster will be deputy to W. Averell Harriman, his former boss in the Department of Commerce, and now ECA special representative in Europe.

During the war, Mr. Foster served as chairman of the Purchase Policy Advisory Committee of the War Department, as special representative to the under secretary of war on procurement for the Army Air Forces, and as chairman of the board of governors, region II, Smaller War Plants Corp.

His resignation from the Department of Commerce is effective May 31.

Machine Tool Exports Off

Machine tool exports from the United States continue to trend downward. Total machine tool exports in the first two months of 1948 came to $14,393,239. This compares with $23,290,563 for the first two months of 1947.

Exports to Russia reflected a much greater decline than the total of all exports. Shipments to Russia during January and February of this year came to $818,843, compared with $5,371,000 in the first two months of 1947.

Enlarge Travelers' Exemptions

Americans returning from foreign lands now may bring in a much larger quantity of foreign goods free of duty. In addition to the 50-year old exemption which allows a returning traveler to bring in free of duty merchandise purchased abroad for personal use up to the value of $100, a further exemption of $300 once in six months for persons returning from trips abroad of 12 days' duration or longer has been authorized by Congress.

The move was made as part of the general effort to get more dollars into foreign countries so as to facilitate their purchase of American goods and thus reduce the load of foreign assistance on taxpayers. Customs collectors have been instructed to put the new exemption into effect immediately.

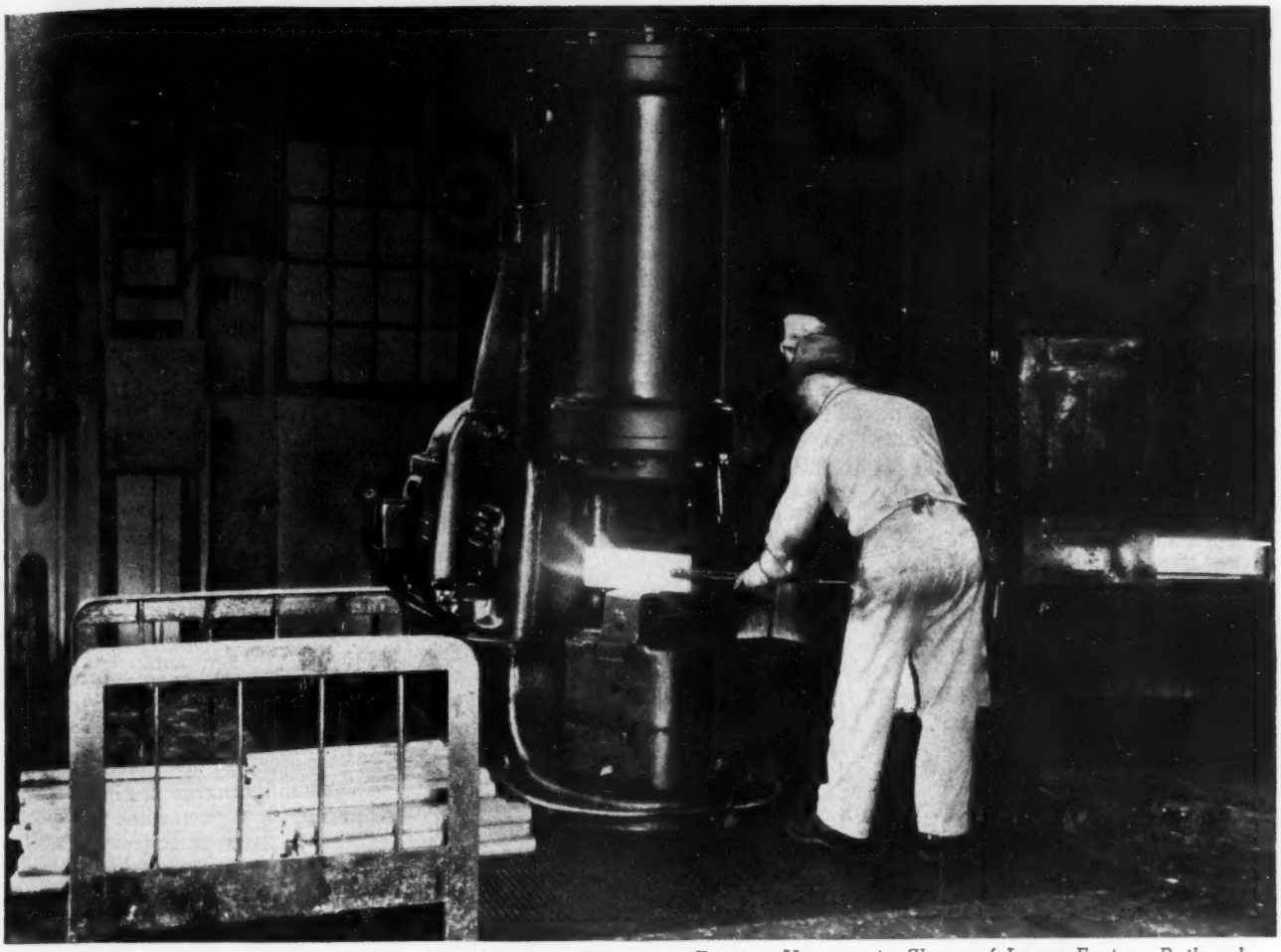
Warns of U.S. Spending

The Democratic party's No. 1 advocate of economy in government, Sen. Harry F. Byrd of Virginia, has renewed his warning against continued increases in federal spending.

"We are rapidly approaching a real crisis in our federal expenditures," he warned the Senate. "We have undertaken obligations that could destroy our free enterprise system. I, for one, do not believe that this democracy can preserve its private enterprise system, which is its foundation stone, and spend $50 billion a year for federal expenditures and $13 billion or more for local and state expenditures, making a total of approximately $65 billion for government, or more than 30 per cent of the present combined personal incomes of all Americans.

"Neither our own people nor those who seek our aid should ever forget that the might of America lies in our strength here at home—our fiscal solvency, our productive capacity under the free enterprise system and our ability to finance our obligations without crushing taxation. . . . If the fiscal stability of America weakens, the whole civilized world will follow."

He accused the Republicans of doing a lot of talking about economy but of accomplishing little in that



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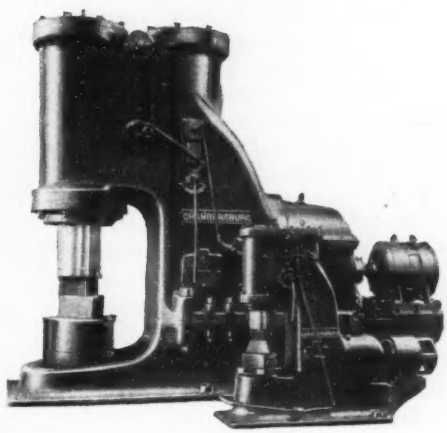
The Chambersburg Pneumatic Hammer can be located anywhere without respect to steam lines, air lines, shafting or belting. It carries its own source of power—its motor-driven compressor. There is no load on steam boiler or air compressor—yet, wherever electricity is available, it is ready for work instantly.

A wide range of sizes—200 lbs. to 5000 lbs.—makes this unit ideal for practically any forging requirement, from tool room use in forging and dressing tools, in foundry work, as in straightening reinforcing rods, etc., to large forgings for maintenance or production. Write for Bulletin 1275.



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direction. He accused the Democratic leadership of not even having done any talking about economy.

On the current volume of business, and at existing tax rates, he said, the most federal income that can be raised is between $40 and $42 billion "unless we go into a spiral of inflation which, in itself, would mean ultimate disaster."

Even a slight recession in national income would at once make itself felt. "A 10 per cent decline in national income would mean a loss of revenue of approximately $7 billion annually." And the present trend of continually increasing expenditures, he thought, is a poor way to get ready for any tough times that may lie ahead.

Will Congress heed Senator Byrd's warning? Probably not; Congress today is in a spending mood and has little thought for tomorrow.

Power Expansion Underway

Although the electric power situation in the United States is tight, some optimism is offered in that electric companies are now engaged in the greatest expansion program in their history.

This was the summation offered by Arthur M. Hill, chairman of the National Security Resources Board, of a staff study of the power situation.

The seriousness of the situation, he said, lies in the fact that during 1947 electric power capacity was consumed to within a 5 per cent average margin above peak loads, compared with more than a 20 per cent margin in 1941.

Mr. Hill indicated that, barring unforeseen circumstances, the expansion program should proceed according to schedule, with reasonable assurance of adequate electric power in most areas except the Pacific Northwest, where the situation is becoming progressively acute. He warned, however, that "if there should be any slippage in the fabrication and erection of these new power plants on schedule, there would be great danger of serious power shortages in many areas of the country."

New Legislation

Bills of interest to the metals and metalworking industries passed by Congress and sent to the White House are:

H. J. Res. 384, which provides for duty-free importation by the International Industrial Exposition Inc. of goods to be exhibited at the International Industrial Exposition in Atlantic City, N. J., June 26-Sept. 11. It provides similar treatment of goods imported for constructing, servicing or installing exhibits at this exposition.

H. R. 6489 provides for free importation of lead and lead-bearing material until close of June 30, 1949.

H. R. 6242 continues until June 30, 1949, the authority to permit duty-free importation of scrap iron, scrap steel and nonferrous metal scrap.

H. R. 5153 authorizes up to $1,000,000 for construction and $500,000 for annual maintenance of an experiment station in the Appalachian region for research on "production, refining, transportation, and use of petroleum and natural gas." Purpose is to obtain more yield from old, partially exhausted fields.

Push Standardization

Trend toward standardization of armed services equipment will be accelerated by two new Munitions Board units—the Munitions Board Cataloging Agency and the Munitions Board Standards Agency.

The standards agency is to develop unified agreement on specifications and engineering standards of the Army, Navy and Air Force for equipment and component parts. The cataloging agency is to create a single catalog from which the three military arms will do their procuring. Each item will be provided with a single name, description, and identification number, and will be classified in but one supply commodity. Three years has been set as the time necessary to bring the cataloging program to full utilization.

Creation of a single catalog is intended to reduce procurement costs, to reduce costs of manufacture by having fewer standards, and speed up deliveries. Better service and reduced prices to the public may result where the public buys the same types of goods as the armed services. The catalog will list some 5 million items of military usage.

State Laws Govern

National Labor Relations Board has declined to hold union shop elections in states where compulsory union membership is outlawed by state legislation. A majority of the board has decided that the Taft-Hartley Act "in effect removes all federal restrictions upon existing and future state legislation prohibiting compulsory unionism." The majority of the board held the T-H law makes it clear that the intent of Congress was to "leave to the exclusive jurisdiction of the state the prohibition of union shop agreement" and that federally conducted elections would only lead to the "circumvention and frustration of state law."

T-H Changes Proposed

Five changes in the Taft-Hartley Act have been proposed before the joint congressional labor committee by Rep. Gerald W. Landis (Rep., Ind.). The committee headed by Sen. Joseph Ball (Rep., Minn.) is conducting hearings to determine what changes should be made in the labor relations law passed last year.

Representative Landis proposes:

1. Two more members be added to the National Labor Relations Board or that more power be delegated to the legal staff to enable the board to handle the greater work load.

2. Business agents and other union representatives negotiating contracts be required to sign anticommunist affidavits. Management representatives also would be required to file similar affidavits.

3. Employers be given complete freedom to discharge any person who is proved to be a member of an organization listed as subversive by the attorney general.

4. Provisions restricting the checkoff be clarified so that unions and employers may know whether initiation fees and assessments may be checked off.

5. The NLRB be relieved of responsibility for holding elections to determine whether a majority of workers in a company desire to bargain for a union shop clause in their contract with management.

Ask Virden To Stay

General regret was being expressed in Washington last week over the resignation of John C. Virden, Cleveland industrialist, as director of the Office of Industry Co-operation, the Department of Commerce agency in charge of the voluntary allocations program.

Mr. Virden submitted his resignation rather than embarrass Secretary of Commerce Charles Sawyer after a small furor had been raised in Congress over the fact that Mr. Virden's daughter is employed by Tass, Soviet news agency.

Supporters of Mr. Virden were quick to point out that he was a man of unquestioned integrity and that his record is one of devotion to the American way of life and business and of opposition to communism.

Mr. Sawyer had refused to accept Mr. Virden's resignation and the fight to keep him in his post was carried to the floors of Congress.

Facts for Industry . . .

(As reported by government agencies)

Complete Aircraft, Engines — March production of complete aircraft, as measured by airframe weight, totaled 2,055,300 lb, compared with 2,033,000 lb in February. Of the 863 craft shipped, 585 were for civil use and were valued at $7.2 million. a 41 per cent increase over the previous month. Military planes accounted for 65 per cent of the March airframe weight. Value of engines and parts shipped in March was $30.1 million, a 16 per cent increase over February. *Census Bureau, Commerce Dept.*

Wrought Magnesium — March shipments of magnesium wrought products, at 460,000 lb, were higher than in any month since last March, and were 12 per cent greater than February's shipments. *Census Bureau, Commerce Dept.*

Wrought Aluminum — The highest monthly figure reached in the postwar period for aluminum wrought product shipments was recorded in March at 159,109,000 lb. This was 17 per cent higher than February's shipments and reflected gains in all classes of products. Aluminum plate, sheet and strip accounted for 126,675,000 lb of the total, rolled structural shapes, rod, bar and wire for 15,280,000 lb, extruded shapes, tube blooms, and tubing for 16,032,000 lb, and powder, flake and paste for 1,122,000 lb. *Census Bureau, Commerce Dept.*

Closures — Production of commercial metal and plastic caps and milk bottle closures amounted to 2271 million units in February, 2 per cent more than January's total. Metal caps accounted for 667 million, plastic caps for 201 million, and milk bottle closures for 1403 million. February production of crowns was 28 million gross, 5 per cent below the January total and 15 per cent below the postwar peak in October last year. Output of metal screw bands for home canning declined to 327 thousand gross in February from 343 thousand gross in January, and production of metal lids for use with these bands eased to 897 thousand gross from 1020 thousand gross in January. One-piece zinc, porcelain-lined screw caps and glass lids increased to 127 thousand gross from 104 thousand gross in January. Tin mill products consumed in February for metal closures amounted to 514 thousand base boxes of metal, divided thus: Metal caps for commercial closures 184 thousand base boxes; crowns 270 thousand base boxes; and home canning closures 60 thousand base boxes. *Census Bureau, Commerce Dept.*

Steel Shipping Containers—Production of heavy-type steel barrels and drums in March at 2.5 million was larger than for any month since the war peak of 2.6 million in October, 1943, and was 21 per cent over February. March output of light-type barrels, drums and pails was 920,820 units, compared with 788,511 in February; 5,483,179 steel packages, kegs and pails were produced, compared with 4,222,043 in February. This was the highest production since April, 1947. *Census Bureau, Commerce Dept.*

Fans, Blowers, Heaters — Value of shipments of fans, blowers, unit heaters and accessory equipment amounted to $23.4 million during the first quarter, a decrease of 8 per cent from shipment value for fourth quarter, 1947. Orders booked in the latest period, valued at $18.4 million, were 12 per cent below bookings in the previous quarter and 18 per cent below the amount for first quarter, 1947. Fans and blowers accounted for $13.3 million of the total, and unit heaters for $9.8 million, an increase of 9 per cent and a decrease of 25 per cent, respectively, from the previous quarter. Fan and blower bookings were up 6 per cent; unit heater orders were down 33 per cent. *Census Bureau, Commerce Dept.*

Crude Petroleum—Average daily crude runs to stills of 5,387,000 bbl in March were 7000 bbl above February and 544,000 bbl above March, 1947, daily averages. Foreign crude imports averaged 280,000 bbl daily, 8000 bbl below the previous month's average and 19,000 bbl below March, 1947. Crude oil stocks at refineries were 827,000 bbl higher than at the end of March, 1947. *Bureau of Mines, Interior Dept.*

Lack of Steel Cuts Output On West Coast

STEEL shortages still are the biggest single drawback to production of finished products in five major steel-using companies in the San Francisco area.

Although these companies have been favorably affected by recent reduction in base steel prices, they say their problem isn't high prices, just a scarcity of the metal. They also report that with the need for steel as great as ever, and supplies diminishing, signs of a gray market also are increasing.

Among companies surveyed is a leading steel shipping drum producer. It reports the steel shortage has curtailed output about 25 per cent, and sees no prospect of increasing supplies of steel soon. Biggest scarcity is in light gage sheets.

Galvanized Sheets Scarce—Shortage of light galvanized sheets is the biggest problem plaguing a large furnace manufacturer. "We just manage to get by from day to day," says an official. Production is definitely curtailed, he said, and the company is turning down many jobs calling for a lot of steel and little labor.

The general steel shortage also is being felt in tin plate, according to a canmaker. The company's supply of tin plate is the smallest in months, while the company's orders in the first quarter this year were 50 per cent higher than last year.

Scrap, Pig Iron "Critical"—A producer of diesel engines and other heavy equipment reported an improvement in the supply of steel bars and rods, but this has been offset by greater restrictions in the supply of tin plate and castings. An official termed the shortage of pig iron and scrap as "critical."

Steel supplies of a producer of food processing equipment are declining.

Ryerson Opens Expanded Warehouse at Cleveland

The expanded and modernized steel warehouse at Cleveland of Joseph T. Ryerson & Son Inc., Chicago, was shown to customers and friends at an open house May 21. A new building with 80,000 sq ft of storage space and 13,000 sq ft of office area increases capacity 30 percent. Ryerson's Philadelphia warehouse also is being modernized.

Approve More Steel Allocations

Atomic energy projects to get 160,000 tons and house heating equipment 212,000 tons. Steel producers' committee opposes 58,000 tons for prefabricated housing

ALLOCATION of 372,000 tons of steel for U. S. Atomic Energy Commission projects and for use in producing warm air heating equipment for housing was approved at the recent meeting of the Steel Producers Industry Advisory Committee with Department of Commerce officials and representatives of other government agencies.

In addition to approving allocation of 160,000 tons of steel, beginning July 1 through next February, for atomic energy projects, and 212,000 tons for heating equipment, the meeting considered a resubmitted request for 58,000 tons of steel for prefabricated housing, and discussed the scrap situation.

John C. Virden, who has resigned as director of the Office of Industry Co-operation, reported on progress of the voluntary agreements program, and stated that in addition to the freight car project, nine voluntary industry agreements are expected to be put into effect shortly.

Steel Men Shocked—Resubmission of the request for steel for prefabricated housing came as a distinct shock to members of the Steel Producers Committee, a request which both Commerce Secretary Sawyer and Housing Administration Foley urged the steel men give favorable consideration.

While nobody said so at the meeting, it is known that the request for the prefabricated housing steel originated in Congress, where it is believed "factory-made" steel houses, produced by mass production methods at great savings in comparison with the cost of conventional housing, will be the real solution of the problem of providing low-cost housing.

It was pointed out at the meeting that the requested 58,000 tons was not for volume production of housing. Rather, it was to be used experimentally by a number of prefabricators in an effort to develop all-steel prefabricated houses that will have public and governmental approval.

Raise Objections—The steel men voiced a number of objections to the proposal. They said research work has been going on for more than 25 years in this field and there is no assurance the requested 58,000 tons would be converted into usable steel houses. Also that it takes as much as 9 tons of steel to build a prefabricated steel house, and it would be more practical to build conventional homes which require only 1½ tons of steel each. Furthermore, they said, assuming experiments with the 58,000 tons resulted in the evolution of successful all-steel prefabricated house designs, there would thus be created a market calling for possibly 500,000 to 1,000,000 tons of steel a year. The present is not the time to create such a large new demand.

They were inclined to feel there should be no such diversion of steel at this time. From an overall public point of view, they felt, it would be much better to continue to let the maximum amount of steel flow out uninterruptedly to the thousands of uses to which it is being put in manufacturing consumer products of which the supply isn't yet what it should be to discourage high prices. It was pointed out, for example, that 500,000 tons of steel is equivalent to 335,000 new automobiles. Even the immediately requested 58,000 tons for experimental housing is enough steel for 38,660 new automobiles. The steel men felt it would be better to get out that many more automobiles, or other goods which the public urgently needs at the moment, rather than divert a sizable tonnage for experimental use in seeking to create a new demand.

Call Door Meeting—Representatives of the steel door and buck industry were invited to meet with Department of Commerce officials in Washington May 27 to discuss the department's activities in the housing field under the voluntary agreements program.

Coke & Coal Chemicals Group Meets June 7-9

American Coke & Coal Chemicals Institute will hold its annual meeting June 7-9 at the Greenbrier, White Sulphur Springs, W. Va.

One general session will be devoted to coal chemicals with P. S. Savage, vice president of Donner-Hanna Coke Corp., serving as chairman. Speakers on this subject will be Maurice H. Lockwood, president of the National Fertilizer Association, and L. A. Schlueter of American Coke & Coal Chemicals Institute. W. Reed Morris, vice president of Koppers Co. Inc., will be chairman of another session on gas. Speakers discussing this subject will be E. S. Pettyjohn, director of Institute of Gas Technology, and W. C. Schroeder, chief of the Office of Synthetic Liquid Fuels, U. S. Bureau of Mines.

Coke will be the subject for a third session, with Samuel Weiss, executive secretary of the institute, serving as chairman. Speakers will be Daniel E. Krause, executive director of Gray Iron Research Institute Inc., and Bernard P. Mulcahy, chairman of the Coal & Coke Research Committee, American Coke & Coal Chemicals Institute.

Calendar of Meetings . . .

May 31-June 2, National Association of Purchasing Agents: Annual meeting, Waldorf-Astoria Hotel, New York. Association headquarters are at 11 Park Pl., New York.

May 31-June 5, American Society of Mechanical Engineers: Semi-annual meeting, Hotel Schroeder, Milwaukee. Society headquarters are at 29 W. 39th St., New York.

June 6-9, American Gear Manufacturers Association: 32nd annual meeting, The Homestead, Hot Springs, Va. Association executive secretary is Newbold C. Goin, Empire Bldg., Pittsburgh.

June 6-11, Society of Automotive Engineers: Annual summer meeting, French Lick Springs Hotel, French Lick, Ind. Society secretary and general manager is John A. C. Warner, 29 W. 39th St., New York.

June 7-9, American Coke & Coal Chemicals Institute: Annual meeting at the Greenbrier, White Sulphur Springs, W. Va.

June 7-11, Pittsburgh International Conference on Surface Reactions: Conference will be held at the Mellon Institute, Pittsburgh. Conference secretary is Richard Rimbach, 1117 Wolfendale St., Pittsburgh.

June 10, Pressed Metal Institute, Chicago-Milwaukee District: Second fall-winter-spring meeting at Milwaukee Athletic Club, Milwaukee. National institute president is Tom J. Smith Jr., 629 Union Commerce Bldg., Cleveland.

June 11-12, American Society of Metals: Sixth biennial Pennsylvania interchapter meeting of groups located wholly or partly in the state, State College, Pa.

June 16-18, Electric Metal Makers Guild: 16th annual meeting, Bethlehem, Pa. Secretary-treasurer of the organization is D. L. Clark, 39 Grasmere Rd., Lockport, N. Y.

June 18, American Foundrymen's Association: Annual meeting of association's technical correlation committee, LaSalle Hotel, Chicago. Association headquarters are at 222 W. Adams St., Chicago.

June 21-25, American Society for Testing Materials: Annual meeting and exhibit of testing apparatus and related equipment, Book-Cadillac Hotel, Detroit. Society headquarters are located at 1916 Race St., Philadelphia.

June 21-25, American Institute of Electrical Engineers: Summer general meeting, Mexico City, Mexico. Institute secretary is H. H. Henline, 33 W. 39th St., New York.

June 28-July 1, American Electroplaters' Society: Annual convention and industrial finishing exposition, Ambassador Hotel, Atlantic City, N. J. Society headquarters are at 473 York Rd., Jenkintown, Pa.

Raw Materials Pace German Steel Output

DUSSELDORF, GERMANY

INDIGNATION is prevalent here over the recently leveled charge that German steel companies retarded production and limited shipments in anticipation of the recent steel price increases. An open letter by the German Steel Association declares that the belated imports of Swedish iron ore, the shortage of scrap as a result of heavy exports, and insufficient supplies of coal, gas, power and refractory materials, rather than wilful production curtailments, are responsible for the low level of German steel output

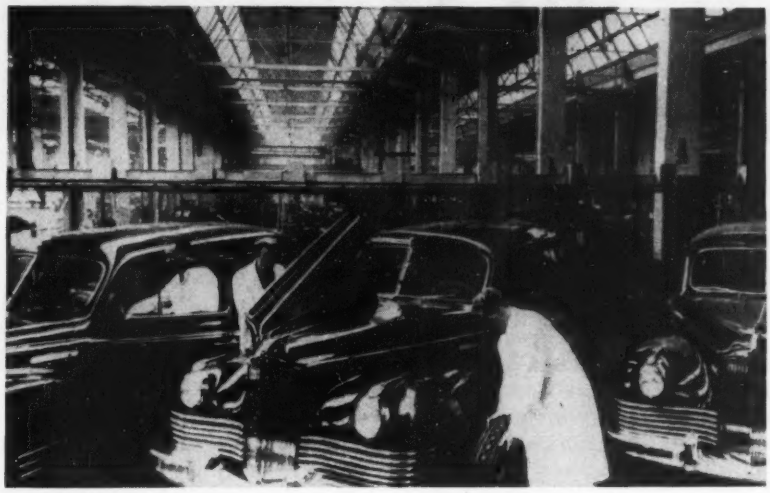
This group claims 2.01 million tons of rolled steel products were made last year and that that same amount was shipped. Allied authorities, however, quite suddenly are interested in boosting production appreciably.

Annual production of six million tons would require a monthly coal supply of 760,000 tons. Under allocation to the industry, however, are only 560,000 tons a month, and since coal mining cannot be stepped up sufficiently and reserves are not available, a critical bottleneck in this raw material exists.

Some steel is to be shipped to Germany under the European Recovery Program, which will aid in that country's reconstruction, but although a three-million-ton figure had been talked of recently, actual negotiations aim at 750,000 tons only, half of which would be shipped from the Saar.

Study Under Way — Problems of Ruhr steel production are under study now by an Allied-German commission which is located at Dusseldorf. On this board are two Americans—J. M. Kelly and John Tokish—two Britons —Sinclair Kerr, steel advisor to Lord Pakenham and a director of Lancashire Steel Corp., and H. C. Dawson, steel expert of the British Military Government— and two Germans —Herrman Reusch, president, Gutehoffnungshuette, Oberhausen, and Paul Bleiss.

The recent increase of 66 marks in the steel price actually entails a loss to producers of 16 marks per ton, since now the subsidy to the industry of 50 marks has been eliminated and raw material costs are up 32 marks. As the net result of the advances made in all basic commodities, German prices as a whole are mounting and the whole price structure is being revised. German business men feel the revision should not be undertaken until the currency reform is completed and until true price-cost relationships become known.



"NEW" RUSSIAN CARS: These are not prewar Packards, as one might suppose, but new ZIS models in the Stalin Enterprise factory in Moscow. Cars are shown in the finishing room and are designed for the higher bracket Soviet officials

Decision by the Allies to fix the mark conversion rate at three and one-third to the dollar came as a great shock to interested Germans. The 30-cent mark is widely regarded as too expensive, although it opened up enormous sales potentials abroad for German products. Importance of the new conversion rate is that for the first time since the war German exporters are receiving world market prices for their products rather than domestic ceiling prices for goods sold at world market prices.

Prices Are Competitive — A comparison of recent (April) steel prices in the United States, on a Pittsburgh base, and German prices under the 30-cent mark and under a 20-cent mark, which it is believed might come with the currency reform, shows that German prices in many products are competitive in world trade with U. S. prices. Specific product prices per short ton are listed below.

Product	U. S. Price	German Price 30-cent mark	German Price 20-cent mark
No. 2 Fdry. Pig Iron ..	$40.50	$39.50	$29.00
Carbon Steel Ingots ..	90-95	40.00	30.00
Forging Blooms	54.00	46.20	30.80
Rerolling Billets	45.00	49.30	33.00
Steel Bars	58.00	57.50	38.50
Wire Rods	63.50	60.00	40.00
Sheet Bars	60.00	50.80	34.00
H-R Strip	61.00	62.60	41.80
Plates	59.00	62.80	42.00
C-R Sheets	71.00	82.00	54.00
Shapes	56.00	57.00	37.80
Standard Rails	55.50	64.00	47.00

The new prices are also competitive with Belgian and British prices, but a large-scale German sales offensive cannot be expected until some future time after domestic demand has leveled off.

Higher Output Planned — The steel shortage here is critical and even replacement demand is not being met by current steel production. The steel production level program worked out by the bizonal economic administration at Frankfurt provided for stepping up steel production from around one million tons in the first quarter of 1948 to 1.56 million in the first quarter of 1949, equivalent to an annual rate of 6.24 million tons. But this plan provides for production of only about 50 to 60 per cent of basic industrial requirements.

The following production figures have been worked out for the first year of the program (from Apr. 1, 1948, to Mar. 31, 1949): Pig iron 5.0 million tons (of which 1.1 million is foundry iron); steel ingots 5.5 million tons; rolling mill products and forgings 4.2 million tons (divided thus: Hot-rolled 2.55 million, forgings 0.3 million, semifinished 1.15 million, other 0.2 million).

These goals are based on coal consumption of 9.1 million tons and envision sufficient supply of scrap. Power requirements of the program are 1.65 million kilowatt-hours, and 55,000 additional steelworkers would be needed. Also needed in the program are adequate supplies of imported iron ore. Imports of 3.61 million tons are assumed in the plan, with the steel industry processing 35 per cent foreign ores and 65 per cent domestic low-grade ores. If smaller amounts of foreign ores were used, even more stringent bottlenecks in coal and transport would develop.

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By A. H. ALLEN *Detroit Editor, STEEL*

Mirrors of Motordom

General Motors settlement presages peace in motordom for two years. Escalator clause, adjusting wages to cost of living, may continue spiral of inflation

DETROIT

WHEN news of the General Motors wage settlement broke over the jittery automotive industry it was like V-J Day—the war was over—this was it—labor peace for two years. In the upper reaches of the Fisher Building executives swarmed over the tables at the Recess Club and talked the situation out. Among them were a few haggard GM officials who had participated in the union negotiations which climaxed so dramatically Monday night. They were wondering what the reaction to the settlement would be, speculating over whether industry in general felt that they had gone too far, fearful lest the public place a too literal interpretation on newspaper headlines.

There seemed to be general agreement that General Motors had exerted industrial statesmanship of the highest order in its negotiations with the UAW. In the 2500-word statement which GM released summarizing its position there were deft touches of rhetoric and expression seldom seen in the past ten years of labor-management bickering. For example: "You men know, as we know, that big strikes have many of the same aspects as a war. Some day the conflict will be over, and one party or the other may feel that they have won. . . This is only a relative matter, as both the employees and the employer lose. And what is more important the whole country loses along with them. Strikes create additional shortages and result in more inflation. . . Perhaps the easiest thing for us to do would be to say "No" to your economic demands following the position generally taken by many other important employers and hope that with the better crops this summer the cost of living would go down, that in the meantime your union and its members would be patient and would not precipitate a disastrous series of strikes. This would be leaving all the responsibility with you. We believe we should share this responsibility, and after a careful review of the whole situation we have some ideas we think might be helpful."

Union Surprised—In the opinion of many, the lengthy statement from General Motors was one of the most masterful documents ever to emanate from an employer to his working force. Readily detected was the clear, forceful logic of President C. E. Wilson who actually composed much of the presentation. He must have recognized he was carrying the ball for a large section of U. S. industry and he did so with all the skill of a veteran quarterback. Union leaders were so completely flabbergasted that they could do nothing but agree to the terms proposed by the world's largest manufacturing corporation which all of a sudden seemed to have a soul.

Automobile Production

Passenger Cars and Trucks — U. S. and Canada

	1948	1947
January	422,277	336,205
February	399,432	393,636
March	519,112	443,588
April	460,964*	445,137
May		404,191
June		421,466
July		400,944
August		364,478
September		444,501
October		461,533
November		417,493
December		492,109
12 mos		5,055,284

* Preliminary.

Estimates for week ended:

	1948	1947
May 8	84,684	94,756
May 15	83,275	83,201
May 22	88,341	96,651
May 29	85,000	79,315

Estimates by Ward's Automotive Reports

The walkout of 75,000 Chrysler employees paled into insignificance when GM took over the play. Emil Mazey, substituting for the ailing Walter Reuther for the UAW, said briefly, "I believe very definitely that the Chrysler strike will be settled in a few days as a result of the General Motors situation."

The GM settlement was a complicated affair. For every decline of 1.14 points in the Bureau of Labor Statistics cost-of-living index, wages may be reduced 1 cent per hour, but not to exceed 5 cents. Adjustments will be made quarterly and on top of them will be given a so-called "annual improvement factor" of 3 cents an hour, effective at once. The question immediately suggests itself —"How long can such annual increases be met by the corporation?" Obviously the answer must rest with steadily improving productivity and a firm market. Productivity generally in the automotive industry is somewhat better than it was a couple of years ago, but there are spotty situations where it is not what it should be. As far as the market for automobiles is concerned, two years minimum of full demand are seen.

Continuous Spiral? — The conclusion reached by a good many is that as long as GM keeps raising wages every quarter in conformance with the cost-of-living index, the index is bound to keep on rising and so it is a matter of a rat race to see who gets there first.

Against this viewpoint is the previously stated comment that good crops this summer may mean a reduction in the cost of food which is a basic element of the cost of living. One might well follow up this deduction with a question as to what the farmers are going to think of such a proposition. In other words, they will have overproduction and be forced to lower prices, whereupon the automobile workers' wages will be adjusted downward—but not more than 5 cents an hour. With a powerful farm lobby at work as usual in Washington, will not government subsidies continue to be used to bolster any sags in food prices—perhaps with the support of the UAW-CIO to maintain going rates in the auto plants?

What looked like a troublesome situation, prior to the GM wage settlement, was developing at Chrysler after the company had announced plans to use supervisory employees to take inventory during the current strike. The UAW charged the move as an effort to provoke violence and disrupt peaceful picketing, but the company pointed out that the completion of inventory-taking at this time would mean an actual benefit to employees of some 2.5-4.5 million man-hours of work and pay eventually.

Meanwhile, inventories of parts and

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EASY ENTRANCE: Sliding into and out of the new Studebaker trucks is accomplished with the same ease as in passenger cars, thanks to wider doors and increased floor space in the cab

materials were being brought into balance in the various divisions of Chrysler, although it was necessary to route shipments to rented warehouses around Detroit, since no materials could be delivered to strike-bound manufacturing plants. Should an agreement be reached between the union and Chrysler, which will probably be an accomplished fact by the time this appears in print, it will be possible to effect a rapid resumption of full-tilt production. Dodge, for example, is planning to move passenger car production from around 1000 per day to 1500, and the other Chrysler divisions are understood to be moving in the same direction. Pessimistic predictions of a summer-long strike have now been revised in the light of the GM wage agreement.

It has been generally presumed that another round of wage increases would mean further boosts in car prices. The average GM wage lift amounts to around 7-8 per cent, which undoubtedly will be absorbed in view of current good profits. Ford has indicated slight increases in price of 1949 models although cost estimates have not taken into consideration any increase in wage rates. However, it is not likely there will be any re-costing of Ford products, in fact there is question that the company will meet the GM raise, since its basic rate is already about 10 cents over the GM-Chrysler average.

New Hudson Tested

There is no better way to discover just what a new model passenger car offers and does not offer than to take one out and "drive the hell out of it," which is just what this commentator did last week-end with a new Hudson 8-cylinder job, equipped with this manufacturer's version of automatic transmission and overdrive. After 700 miles over all sorts of road surfaces, the conclusion is inescapable that the lowness of the Hudson body design, coupled with oversize low-pressure tires, yield riding qualities matched by few if any production models on the road today. The sensation of "floating" over highway irregularities was a new experience to this observer, along with the roominess of Hudson bodies and their deluxe appointments.

Much might be said for the transmission "options" available on the Hudson. By a simple flick of a button on the dash, the car may be operated in conventional drive, with gearshift, or in automatic two speed transmission, or in three-speed transmission with vacuum shifting, eliminating need for actuating the clutch pedal. This type of transmission, extra equipment amounting to about $100, has much to recommend it over the fully automatic arrangements such as the hydramatic and dynaflow equipment on General Motors cars. The flexibility cannot be duplicated, and the extra advantage of overdrive from the standpoint of economy must be taken into consideration. To anyone who understands and appreciates the mechanism of an automobile, the Hudson system is a natural. What it may involve in terms of service after the car is four or five years old is something else again. This much may be deduced—when the car has aged a few years and transmission service may be indicated, it is a simple matter to switch off the automatic features and revert to conventional drive—something which is not possible in the fully automatic versions. This may be more important than now seems apparent.

1949 Ford To Be Shown

World premiere of the 1949 Ford will be held at the Waldorf-Astoria Hotel in New York, June 10-15, with correspondents getting an advance peek on June 9. Detroit press men had the opportunity to see and drive the new Ford 6 and 8-cylinder models ten days ago, although the meeting was strictly off the record. Driblets of publicity on the model are leaking out here and there, and it can definitely be stated that the new Fords live up to all advance notices. Both the 6 and 8-cylinder engines have been improved as far as fuel economy is concerned, up to 10 per cent being registered in test runs, and 25 per cent with overdrive, which will be factory-installed optional equipment in the forthcoming models. Body lines are startlingly different, low in silhouette and a sharp break from Ford tradition.

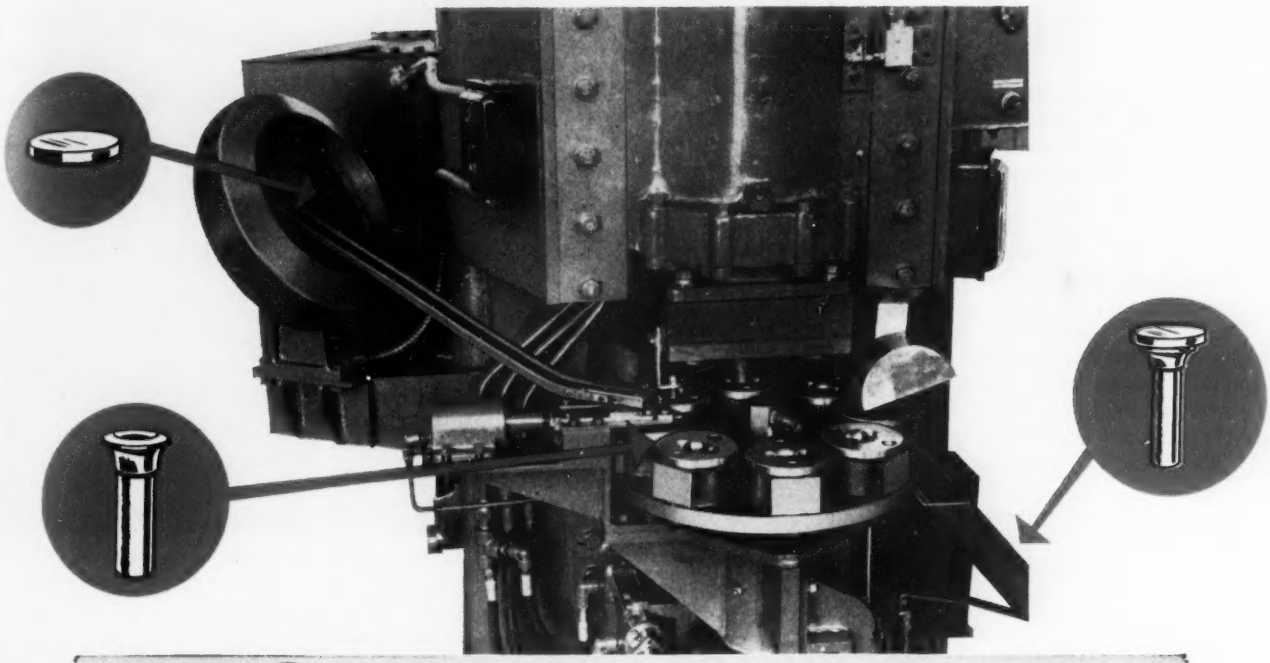
The transportation garage, one of the oldest buildings at the Rouge Plant of Ford, is being demolished to clear space for a new slag dump required for the new blast furnace now going up at the plant. Construction of "C" furnace will double the need for iron ore and limestone, and so that all available ore bin space can be used exclusively for ore, limestone will be stored on a dock where a slag dump formerly was located. Two parallel dumps, each 750 feet long, with drainage, water connections and lights, will be provided.

Honor Pontiac Veterans

"The finest recommendation any company ever could hope to attain" was the phrase used by Harry J. Klinger, general manager, Pontiac Motor Division, as he presented awards to 144 veteran Pontiac employees recently. Their aggregate service is 3959 years.

"You are the living proof that there is no basic conflict between employer and employee," he declared.

MODERN PRODUCTION ARITHMETIC by Federal



+ + FEDERAL WELDER = 1200 PER HOUR

UNUSUALLY HIGH PRODUCTION of over 1200 gasoline engine push rod assemblies per hour with one operator is being performed on Federal's new Automatic Dial Feed Hydraulic Projection Welder.

Operation of the machine is simplicity itself. Alloy steel discs are dumped into the motor driven hopper, the machine is started, the control panel is set and the operator manually feeds the semi-hollow, cylindrical stems into the rotating, automatic-indexing dies.

The machine does the rest; feeds discs into loaded dies, clamps discs in position, welds discs to stems and ejects completed assembly into chute. Welding is performed in a single pass.

This is another example of the time saving, profit producing possibilities of Federal Resistance Welding. Let Federal show you how special dies, jigs and fixtures can be coordinated with resistance welding to increase your production. Write today for further information, or better still, arrange a free consultation with one of Federal's qualified engineers.

THE FEDERAL MACHINE AND WELDER COMPANY
DEPT. 4117, PLANT 2, WARREN, OHIO
Offices in principal cities

SEE COLOR FILM OF THIS WELDER
WRITE TODAY

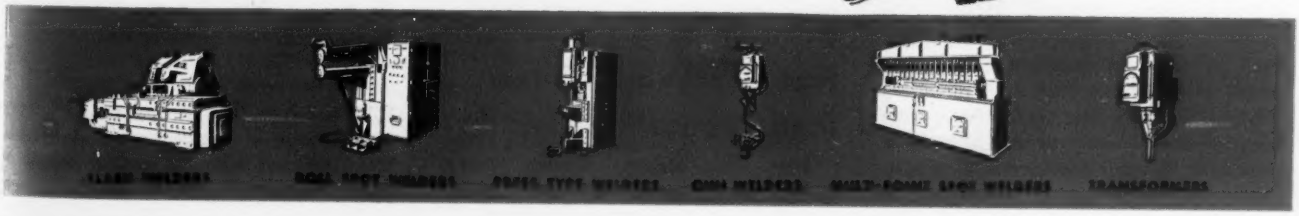


Exhibit Points To Stainless Steel's Rise

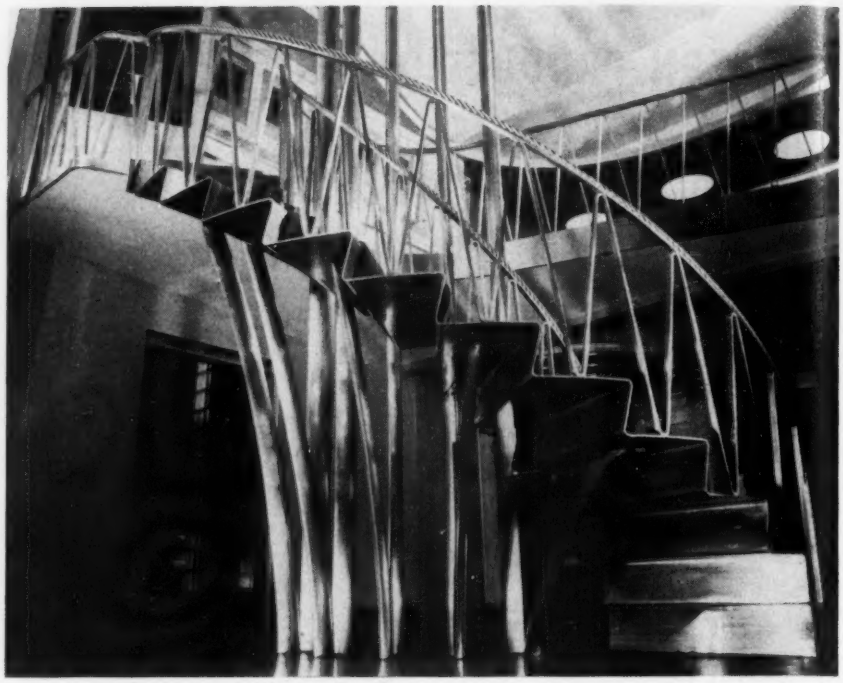
AMERICAN Iron & Steel Institute's stainless steel exhibit at 101 Park Ave., New York, which demonstrates the current widespread use of stainless steels and the possibilities for their increased application, points up the dramatic development of this group of metal alloys over the past 35 years.

Thirteen producers of stainless, plus three producers of the ferroalloys required in their manufacture, contributed to the exhibit through displays and information data. Richard Paret, of the institute, is in charge.

Output Rises—Emphasizing that stainless steel production in the United States has increased from 42,000 tons in 1929 to over 500,000 tons last year, George S. Rose, secretary of the institute, in commenting upon the opening of the exhibit, said that the term stainless steel today denotes a large group of some 30 alloy steels which resemble each other, yet differ widely in characteristics and applications that vary from fishhooks to gas turbines.

The family resemblance, he explained, is based on the fact that all stainless steels contain chromium in addition to the iron and carbon present in all steels. Nickel is an important component of many grades of stainless. Prior to World War I, researchers in England, Germany and the United States added nickel to chromium in steel. After many experiments, a proportion of 18 per cent chromium to 8 per cent nickel was found ideal for a great variety of steel products. This eventually became the "18-8" designation familiar as one of the first commercially successful stainless steels in the middle 1920's. It was not until after World War I that commercial production of any of these steel alloys began in any volume in the American market.

First Used in Cutlery — Stainless steel was introduced here in cutlery, but today the 30 types are used in well over 100,000 items. The automotive industry is now the largest user, followed by the household appliance, container, utensil and food and beverage processing industries. Greatest diversification has occurred since 1930 with oil, dairy, food, textile, chemical and paper industries adopting the various types of stainless.



Modernistic lines mark this stainless steel staircase, a feature of the stainless steel industry exhibit in New York. The show demonstrates scores of applications for these steel alloys, from fishhooks to jet propulsion engines

In 1947 there were about 5000 job-fabricators of stainless steel in this country, and approximately 10,000 industrial companies used the steel alloy in their products.

Warehouse Group Votes To Resume Active Status

Steel Products Warehouse Association Inc., a trade group formed in 1942 but lately inactive, will resume its activities, according to a resolution of 25 former members and trustees who met recently in Cleveland as an organizing committee.

Former officers of the association, headed by Clayton Grandy, former president and executive secretary, together with regional committees named by chapter delegates, will assume administrative functions pending election of permanent officers at a general meeting of members to be held shortly.

Approximately 80 distributors and branch warehouse units are included in the reorganization, with principal chapters in Chicago, Detroit, Cleveland, Youngstown and on the East and West Coasts. Group headquarters are at 1090 Union Commerce Bldg., Cleveland.

Fort Pitt Works Enters Pipe Fabrication Field

Fort Pitt Bridge Works, Pittsburgh, has entered the pipe fabrication field at its Canonsburg, Pa., plant.

Key operating units in the fabrication of the pipe are a new welding mill and a 36-foot press, powered with six 500-ton jacks. This press was used to form bulkhead plates for oil tankers during the war (STEEL, June 12, 1944, p. 98). The company already has shipped over 50,000 feet of 10¾ in. o.d. pipe with ¼ in. wall and welded couplings, used for surface casing.

At present Fort Pitt can fabricate about 250 feet of pipe an hour, but officials state output can be boosted to over 400 feet an hour with some revamping of operating facilities. This could be accomplished by installation of faster pumps on the press and extension of the 36-foot unit.

Gurley Host to Foreign Students, Representatives

Over 100 foreign students of Rensselaer Polytechnic Institute and Russell Sage College, both of Troy, N. Y., representing 35 foreign countries, Puerto Rico and the Canal Zone, recently attended an international students day celebration sponsored by W. & L. E. Gurley, century-old manufacturer of engineering and scientific instruments, also of Troy.

A feature of the celebration was a tour through the Gurley plant where the foreign students and representatives saw engineering instruments being manufactured.

Briefs . . . .

Paragraph mentions of developments of interest and significance within the metalworking industry

Thor Corp., Chicago, manufacturer of home appliances, has appointed Bi-State Distributing Corp., Omaha, Nebr., as its exclusive distributor in southwestern Iowa and most of Nebraska.

—o—

Association of Steel Exporters is the tentative name chosen by 22 merchant exporters of steel who are organizing a national trade association. Robert Marsand, chief export division manager, Harry Harris & Co., Kearney, N. J., is the interim chairman of the organizing committee.

—o—

New York Wire Cloth Co., with plant at York, Pa, has moved its executive offices from 500 Fifth Ave to 445 Park Ave., New York.

—o—

Tonawanda Iron Corp., Buffalo, subsidiary of American Radiator & Standard Sanitary Corp., has been consolidated with the parent company and henceforth will operate as the Tonawanda Iron Division. Bertram S. Stephenson, president of the iron-producing firm, is president of the division.

—o—

Weston Electrical Instrument Corp., Newark, N. J., manufacturer of laboratory and industrial measuring instruments, has named the following representatives: Butler & Land, Dallas, Tex., covering north Texas; Lynn Elliott Co., Houston, Tex., for south Texas; Riddle & Hubbell, Tulsa, Okla., for all of Oklahoma.

—o—

Parker Appliance Co., Cleveland, manufacturer of tube fittings, valves and accessories, has appointed Haskel Engineering & Supply Co., Glendale, Calif., as a distributor.

—o—

American Railway Car Institute, New York, reports that 11,344 hopper cars were built during the first four months of this year, compared with 3390 during the same period in 1947.

—o—

Alfred P. Sloan Foundation Inc., New York, has granted $225,000 to Massachusetts Institute of Technology for a three-year program in the field of executive development and an educational program for a group of outstanding young business executives.

—o—

Vacuum Cleaner Manufacturers' Association, Cleveland, reports factory sales of standard-size household vacuum cleaners totaled 306,588 units in April, compared to 355,200 in the preceding month. Sales for January-April aggregated 1,277,509 units, an increase of 8 per cent over the total in the same months of 1947.

—o—

C. J. Tagliabue Corp., manufacturer of pressure and temperature instruments and subsidiary of Weston Electrical Instrument Corp., has moved offices and production facilities to 614 Frelinghuysen Ave., Newark, N. J.

—o—

Ekco Products Co., Chicago, manufacturer of home appliances and kitchen utensils, is reorganizing its sales arrangements. D. E. Sanford Co., formerly national representative for Ekco, will handle only Rocky Mountain and West Coast territories after July 15. Ekco's own sales force will cover the rest of the country after this date.

—o—

Federal Tool & Mfg. Co., manufacturer of stampings, has moved into a new plant at 3600 Alabama Ave., Minneapolis.

—o—

Atlas Chain & Mfg. Co., Philadelphia, manufacturer of roller chain, has appointed H. H. Jarrett & Associates, Atlanta, as its representative in Virginia, North and South Carolina, Tennessee, Florida, Georgia, Alabama, Louisiana, Mississippi and Arkansas.

—o—

Pittsburgh Steel Foundry Corp., Glassport, Pa., producer of steel castings, has purchased government-built steel producing facilities at its plant in Glassport from War Assets Administration for $1,250,000.

—o—

Manning, Maxwell & Moore Inc., New York, manufacturer of valves, gages and industrial instruments, has acquired the Hydraulics Division of Airex Mfg. Co., Long Island City, N. Y. Airex Hydraulic operations will be carried on by the new owner at 450 Communipaw Ave., Jersey City, N. J.

—o—

Westinghouse Electric Corp., Pittsburgh, has reduced prices from $20 to $125 on a table model and four console radios. Reductions have been made on one model in each of the corporation's five major price brackets.

—o—

Massachusetts Institute of Technology, Cambridge, Mass., has established a foundry program combined with courses in metallurgy, mechanical engineering and business administration to meet the demands for professional training for the foundry industry.

—o—

American Metal Products Co., manufacturer of plumbing and heating supplies, has moved into a new plant at 2911 Compton Ave., Los Angeles.

—o—

Socony-Vacuum Oil Co. Inc., New York, has authorized Vulcan Copper & Supply Co., Cincinnati, to design and erect units developed by Socony-Vacuum to produce ethylene and additional basic materials for the chemical and other industries.

—o—

Allied Oil Co. Inc., Cleveland, has opened a new residual fuel oil marine terminal at Kobuta, Pa., across the Ohio river from Rochester, Pa.

—o—

General Electric Co., Schenectady, N. Y., has begun production of a jet engine, the TG-190, which develops 5000 pounds of thrust. The unit is being installed in the XF-86A, latest version of a new fighter developed by North American Aviation.

—o—

University of Illinois, Urbana, Ill., has published a special bulletin on "Long-Term Manufacturing Opportunities in the Upper Mississippi Valley," by Walter H. Voskuil, mineral economist, Illinois State Geological Survey. Report is a summary of the basic raw materials, supplies of fuels and power and food resources available to prospective manufacturers in this area.

—o—

War Assets Administration has sold the Utah General Sub-Depot, Salt Lake City, to John M. Wallace & Associates, of that city, for $1,620,000. Purchaser intends to develop an industrial area on the property, which consists of 61 buildings located on 950 acres.

—o—

Department of the Navy reduced fire damage to its installations by more than $1,500,000 in the first quarter of 1948, as compared with the same period in 1947. Navy credits the improvement to increased use of sprinkler systems in its shore installations.

—o—

Coatesville Plate Washer Co., Coatesville, Pa., manufacturer of steel stampings and washers, will be host to the Philadelphia chapter of the Pressed Metal Institute at an outing at the Coatesville Country Club June 24.

The Business Trend

BASIC INDICATORS of industrial activity, with the exception of automobile output, are again close to pre-coal strike levels. In the week ended May 22 STEEL's industrial production index rose two points to 161 per cent (preliminary) of the 1936-1939 weekly average.

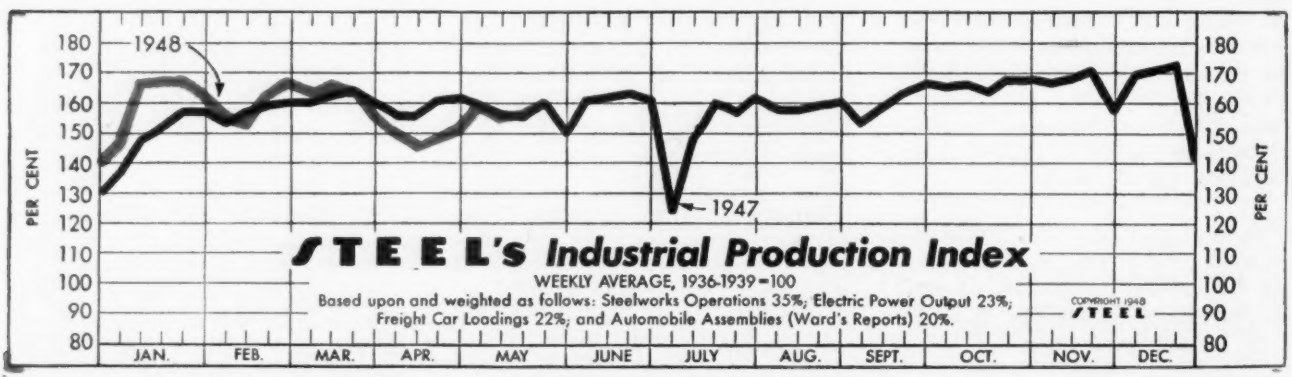
Growing labor unrest, threatening sustained high operations in numerous industries, may subside if last week's General Motors' wage settlement becomes nationally accepted as a pattern, but some industry observers say peace at a price feeds the inflation fires which only recently had been somewhat smothered by many metal producing and metalworking companies through wage-holding and price-cutting actions.

PRICES—Cost of living, as measured by the Bureau of Labor Statistics index of retail prices of goods and services purchased by moderate-income families in large cities, by mid-April had risen to an all-time high of 169.3 per cent of the 1935-1939 average. The 1.4 per cent rise in the month more than offset the price declines occurring from January to March and pushed the index to 8.4 per cent above a year ago, 27.0 per cent over June, 1946, and 71.7 per cent higher than the August, 1939, level. Wholesale prices in the May 15 week were 1 per cent above the previous week.

GROSS PRODUCT—Advancing to an annual rate of $244 billion in the first quarter from $241 billion in last quarter, 1947, the gross national product, as estimated by the Office of Business Economics, Department of Commerce, showed a slackening rate of increase. Personal consumption expenditures, representing $173 billion of the total, increased less than $1 billion, the smallest increase since the end of the war. Passage of the Foreign Assistance Act, income tax reduction and proposed higher military expenditures, however, are seen having an important future effect on prices and production.

ELECTRICITY—Until the end of 1951 the electric power situation will be tight and serious and in the Pacific Northwest it will become progressively worse, according to a report by the National Security Resources Board. In this four-year period 20 million kilowatts will be added to the nation's electric generating systems but until 1951 there will be very little spare capacity for future load growth or equipment breakdowns. Enough orders have already been placed with electric equipment manufacturers to keep them busy through 1949 but some manufacturing capacity is open for 1950 and 1951.

STEEL—Clamor for scarce steel products is unabated and increasing steel requirements for military installations and materiel forebode even tighter supply conditions for industrial consumers. Although the industry is tense over outcome of the current court action against the UMW chieftain and the threat of another debilitating coal strike, the nation's steelmaking operations have recovered from their recent curtailment and at 95 per cent of capacity in the week ended May 22 appear nearing the plateau beyond which materials shortages will prevent further gains.



Index (chart above): Week ended May 22 (preliminary) 161 Previous Week 159 Month Ago 153 Year Ago 160

BAROMETERS of BUSINESS

INDUSTRY	Latest Period*	Prior Week	Month Ago	Year Ago
Steel Ingot Output (per cent of capacity)†	95.0	94.5	75.5	96.5
Electric Power Distributed (million kilowatt hours)	5,085	5,109	5,027	4,663
Bituminous Coal Production (daily av.—1000 tons)	2,205	2,114	1,286	2,143
Petroleum Production (daily av.—1000 bbl.)	5,439	5,423	5,415	5,025
Construction Volume (ENR—Unit $1,000,000)	$82.7	$149.2	$136.7	$113.2
Automobile and Truck Output (Ward's—number units)	88,641	83,275	107,093	96,651

* Dates on request. † 1948 weekly capacity is 1,802,476 net tons. 1947 weekly capacity was 1,749,928 net tons.

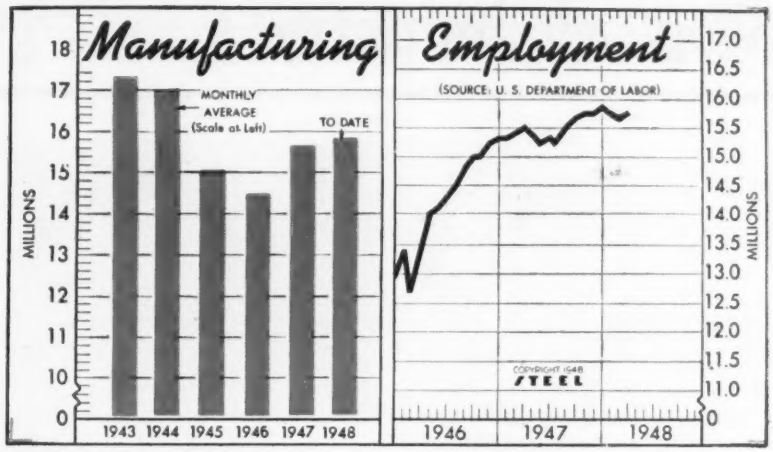
TRADE				
Freight Carloadings (unit—1000 cars)	880†	847	852	891
Business Failures (Dun & Bradstreet, number)	92	100	100	102
Money in Circulation (in millions of dollars)‡	$27,690	$27,762	$27,718	$28,116
Department Store Sales (change from like wk. a yr. ago)‡	+7%	+6%	+8%	+11%

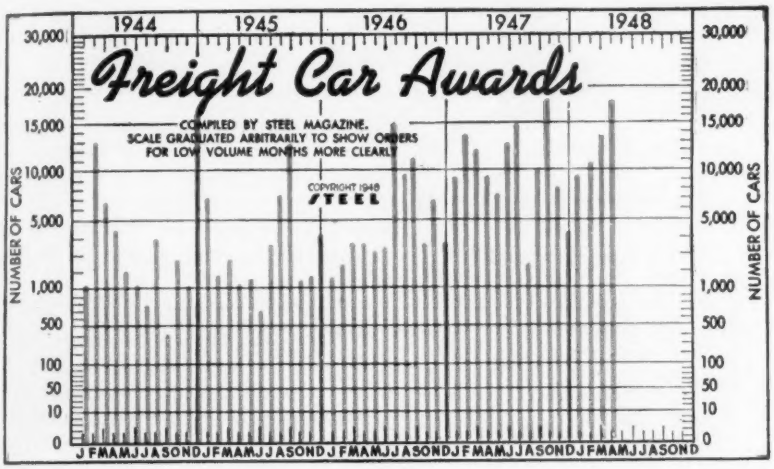
† Preliminary. ‡ Federal Reserve Board.

Factory Employment

(000 omitted)

	1948	1947	1946
January	15,878	15,372	13,499
February	15,775	15,475	12,751
March	15,870	15,510	13,433
April	.....	15,429	14,045
May	.....	15,237	14,159
June	.....	15,327	14,371
July	.....	15,209	14,526
August	....	15,593	14,876
September	....	15,798	15,035
October	.....	15,831	15,064
November	.....	15,872	15,271
December	.....	15,965	15,348
Monthly Ave.	.....	15,552	14,365




1944 1945 1946 1947 1948
Freight Car Awards
COMPILED BY STEEL MAGAZINE.
SCALE GRADUATED ARBITRARILY TO SHOW ORDERS FOR LOW VOLUME MONTHS MORE CLEARLY
COPYRIGHT 1948 STEEL
NUMBER OF CARS
J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D

Freight Car Awards

	*1948	*1947	*1946	1945	1944
Jan.	9,213	9,172	1,481	7,200	1,020
Feb.	10,698	13,727	2,328	1,750	13,240
Mar.	13,427	12,049	3,512	2,500	6,510
Apr.	18,252	9,296	3,564	1,120	4,519
May	....	7,389	2,900	1,526	1,952
June	....	12,784	3,335	670	1,150
July	....	14,840	14,836	3,500	795
Aug.	....	2,372	9,527	7,240	3,900
Sept.	....	9,917	11,102	12,840	400
Oct.	....	17,737	3,407	1,320	2,425
Nov.	....	8,169	6,690	1,650	1,065
Dec.	....	4,218	3,441	4,116	16,245
Total	....	†121,707	66,723	45,432	53,221

* American Railway Car Institute.
† Preliminary.

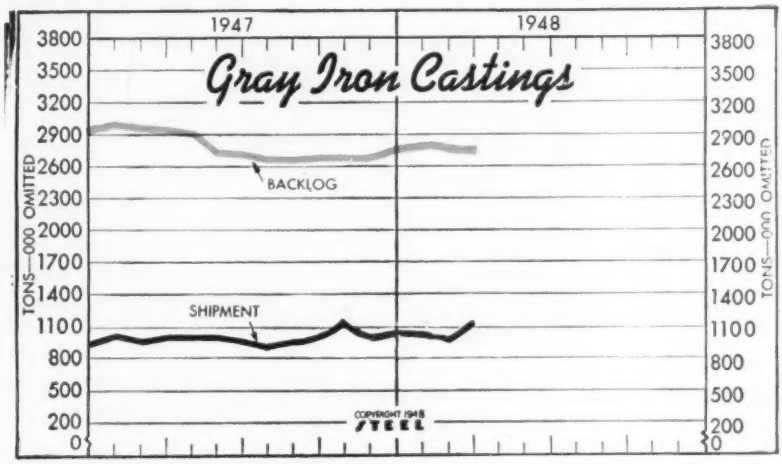
Gray Iron Castings

(U. S. Bureau of Census)

Tons—000 omitted

	Shipments		Backlogs*	
	1948	1947	1948	1947
Jan.	1,064	1,078	2,803	3,021
Feb.	1,024	1,010	2,769	2,987
Mar.	1,169	1,090	2,726	2,979
Apr.	....	1,097	....	2,908
May	....	1,097	....	2,783
June	....	1,038	....	2,711
July	....	913	....	2,657
Aug.	....	952	....	2,631
Sept.	....	1,025	....	2,680
Oct.	....	1,154	....	2,669
Nov.	....	1,020	....	2,687
Dec.	....	1,066	....	2,782
Total		12,541		

* Unfilled orders for sale to the trade.



FINANCE

	Latest Period*	Prior Week	Month Ago	Year Ago
Bank Clearings (Dun & Bradstreet—millions)	$14,744	$12,899	$14,245	$12,557
Federal Gross Debt (billions)	$252.2	$252.2	$252.3	$257.7
Bond Volume, NYSE (millions)	$28.7	$28.5	$33.8	$22.9
Stocks Sales, NYSE (thousands)	13,372	13,174	10,545	5,657
Loans and Investments (billions)†	$63.2	$63.1	$62.9	$63.1
United States Gov't. Obligations Held (millions)†	$35,499	$35,640	$35,260	$39,197

† Member banks, Federal Reserve System.

PRICES

STEEL's composite finished steel price average	$80.27	$80.27	$81.14	$69.82
All Commodities†	163.5	161.9	162.9	147.0
Industrial Raw Materials†	177.7	175.1	178.0	160.2
Manufactured Products†	159.0	157.6	157.8	142.2

† Bureau of Labor Statistics Index, 1926=100.

Men of Industry

CHARLES R. BARTON

RAYMOND A. QUADT

Charles R. Barton, vice president in charge of manufacturing for National Supply Co., Pittsburgh, has retired after 30 years' service. In 1909 he became associated with the National Tube Co. in Ellwood City, Pa. In 1918 he became general superintendent of Standard Seamless Tube Co. at Ambridge, Pa., and 10 years later, when that company was acquired by Spang-Chalfant & Co., he was elected vice president in charge of operations and a director of the latter company. Since 1937 Spang-Chalfant has been consolidated with the National Supply Co., and Mr. Barton has been a vice president and director. In 1940 he was placed in charge of all manufacturing operations of National Supply's six plants in this country.

—o—

Luke E. Sawyer has been elected executive vice president and a director of Babcock & Wilcox Tube Co., subsidiary of Babcock & Wilcox Co., New York. He takes over the major management responsibilities in the company following the death of **Peter D. White,** former president. **Paul J. Utnehmer** has been named works manager in charge of manufacturing at the Beaver Falls, Pa., and Alliance, O., plants of the company, and **E. A. Livingstone,** vice president of the Babcock & Wilcox Tube Co., has been elected to the board of directors. **Alfred Iddles,** president of Babcock & Wilcox Co., the parent organization, has also been elected president of the tube subsidiary.

—o—

H. N. Arbuthnot, assistant to the president, Allegheny Ludlum Steel Corp., Pittsburgh, has been transferred from Detroit to Washington, where he will serve as representative of the company and its president in relationships with the various governmental agencies. He will also assume the duties of manager of sales in the District of Columbia area. In Washington Mr. Arbuthnot will succeed **A. Wilbur Mace,** who will retire July 1.

—o—

Federated Metals Division, American Smelting & Refining Co., New York, has appointed **Raymond A. Quadt** assistant manager of its general aluminum department. Mr. Quadt has been in charge of all the division's aluminum research operations at the central research laboratories of the American Smelting & Refining Co., Barber, N. J., under the direction of **Dr. A. J. Phillips.** In his new position as assistant manager of the general aluminum department, Mr. Quadt will, in addition to his new administrative duties, continue in large measure the research and sales engineering activities of his former post.

—o—

William T. Boyce has been appointed advertising manager, Weatherhead Co., Cleveland. He has been connected with American Steel & Wire Co., Cleveland subsidiary of U. S. Steel Corp., where he was first supervisor of advertising production and later assistant to the advertising manager.

—o—

Laclede-Christy Clay Products Co., St. Louis, announces the following appointments on the West Coast: **Julius A. Kayser,** formerly assistant to the president, has been elected resident vice president and manager of Pacific Coast activities. He will have offices at San Francisco. **William E. Daugherty** has been appointed district manager, with offices at Los Angeles. **Russell K. Wasmann** has been appointed district manager at San Francisco. **Walter Emes** has been appointed superintendent of the West Coast plant, now nearing completion at Warm Springs, Calif.

—o—

George S. Hastings, head of the patent department and a member of the board of directors, American Machine & Foundry Co., New York, has been appointed a vice president of the company.

—o—

Elmer H. Weihe, associated with Owens-Corning Fiberglas Corp., Toledo, O., and predecessor companies for over 30 years, has been named assistant treasurer of the Fiberglas corporation. He has served as credit manager since 1942.

—o—

William H. Taylor has been appointed director of engineering, Tinnerman Products Inc., Cleveland. He joined the firm in 1945 as sales engineer in the Detroit office, and later, district manager. In his new capacity he will direct all Tinnerman engineering at the company's Cleveland plant. He is succeeded at Detroit by **Ray B. Templeman,** who joined the company last year at the Detroit office as a sales engineer, after serving the Chevrolet Division of General Motors Corp. for 12 years.

—o—

George Squibb has been appointed chief engineer, Detroit Broach Co., Detroit. He succeeds **Leon Caplen,** resigned after 13 years as chief engineer. Mr. Caplen will continue to be associated with the company in the capacity of consulting engineer.

—o—

Paul Y. Duffee has been appointed chief engineer, McConway & Torley Corp., Pittsburgh, manufacturer of carbon and alloy steel castings and railroad specialties.

—o—

Earl O. Shreve, vice president on the president's staff, General Electric Co., Schenectady, N. Y., and president of the U. S. Chamber of Commerce, has retired from the company after 44 years of service.

—o—

Truman B. Brown, former assistant manager, cutting and tool steel sales, with offices in Pittsburgh, Allegheny Ludlum Steel Corp., has been appointed assistant district manager

Production Up 22% on 44-Inch Pinion Gears

SUNICUT . . .

Enables Gear Manufacturer to Increase Feed, Speed, and Tool Life; and to Improve Finish

Since changing to Sunicut, a manufacturer of steel-mill gears has increased production by 22%, improved finish, and added greatly to the life of his gear cutters.

Operation: Cutting 44" herringbone gears.
Machine: Dominion herringbone gear generator.
Materials: Stainless steel, high carbon steel, bronze, other alloys.
Cutting Oil: Sunicut.

This case is just one of thousands in which experienced production men have found that Sun "Job Proved" cutting oils help to increase production and to improve quality as well.

Sunicut is a clear, free-flowing cutting oil, produced by an exclusive Sun process. It has high lubricating value and has excellent heat-dissipating and anti-weld properties. It makes possible heavy cuts at high speed while accuracy and satin-smooth finish are maintained. For full information call your Sun Cutting Oil Engineer or write Department S5.

SUN OIL COMPANY • ***Philadelphia 3, Pa.***
In Canada: Sun Oil Company, Ltd.—Toronto and Montreal

SUN
SUNOCO
INDUSTRIAL PRODUCTS

of sales for the Detroit territory. **Roger S. Ahlbrandt,** former district manager of sales for Pittsburgh territory, has been named to succeed Mr. Brown. **Max J. Pischke,** former manager, warehouse and jobber sales, has been appointed district manager of sales, Pittsburgh territory, succeeding Mr. Ahlbrandt.

—o—

Ohio State University's Lamme Medal for meritorious achievement in engineering will be awarded this year to **Earle C. Smith**, Cleveland Heights, chief metallurgist of Republic Steel Corp.

—o—

Russell J. Nadherny has been elected executive vice president and director of engineering and production, Barnes & Reinecke Inc., Chicago. He has been associated with the firm as chief engineer, and previously had been vice president in charge of engineering for Athey Products Corp., and chief engineer for Mercury Mfg. Co.

—o—

Charles Beard has been appointed general sales manager, Vic Pastushin Industries Inc., maker of airplane parts and sheet metal products. For the past seven years Mr. Beard had been with Douglas Aircraft Co. Inc.

—o—

E. V. Murray has been appointed manager of personnel and public relations, Atlas Steels Ltd., Welland, Canada. He has been associated with the firm since 1935, first in charge of production planning, and for the past year as assistant to the general sales manager. Mr. Murray succeeds **D. G. Willmot,** resigned to accept a position with his former company.

—o—

Robert M. Griffith has been appointed manager, Indianapolis district sales office, Berger Manufacturing Division, Republic Steel Corp., for Indiana and part of Kentucky. Mr. Griffith started with Truscon Steel Co., subsidiary of Republic Steel, in 1939, and later transferred to the Berger Division as a sales engineer, working out of the Philadelphia office. Following release from the U. S. Army Air Forces in 1944, he rejoined Berger in Philadelphia, resuming his work as sales engineer.

—o—

Neil W. Vogt, formerly manager of distributor sales office, Ditzler Color Division, Pittsburgh Plate Glass Co., Detroit, has been appointed to handle new jobber business and export sales. He has been a member of the distributor department for 18 years. **Rolland L. Smith,** formerly assistant promotion manager, has been connected with distributor sales for 15 years, and has now been appointed in charge of sales training and educational work.

—o—

Carleton C. Hitchcock, partner in R. C. Hitchcock & Sons, Minneapolis, has been elected chairman of the Twin City chapter of American Foundrymen's Association for 1948-1949, and **Franklin P. Austin,** vice president, Crown Iron Works Co., has been elected vice president of the chapter.

—o—

Chester K. Faunt, works manager, Christiansen & Olsen Foundry Co., Chicago, has been elected president of the Chicago chapter, American Foundrymen's Association, for 1948-1949. He served as vice president for the past year and previously as a director. **William D. McMillan,** works metallurgist, McCormick works, International Harvester Co., Chicago, has been named to succeed Mr. Faunt as vice president of the association.

—o—

H. W. North Co., Erie, Pa., manufacturing engineer and designer of mixing and processing machinery, has appointed **D. W. DuVall** eastern sales manager, with headquarters at Upper Montclair, N. J.

—o—

Robert Watson has been appointed representative, Railway Equipment Division, American Welding & Mfg. Co., Warren, O. He will make his headquarters at Chicago.

—o—

Engineering mechanics department, Midwest Research Institute, Kansas City, Mo., announces the following new members: **Herbert Arenson,** recently with North American Aviation Inc., and the Panhandle Eastern Pipe Line Co.; **Malcolm R. Easterday,** assigned to the electronics section, was previously with electronics development laboratories, Railway Radiotelephone Co. Inc., Kenmar Engineering Co. and Aieron Mfg. Co., all of Kansas City; **Wallace M. Yocum** will be employed as a draftsman and mechanical designer; and **Lawrence A. Platt,** formerly with Keystone Trailer & Equipment Co., and more recently with Butler Mfg. Co., Kansas City.

—o—

Walter Koelliker, wartime commanding officer of the U. S. Army Air Forces detachment at Sperry Gyroscope Co., has joined Jack & Heintz Precision Industries Inc., Cleveland, as engineer for the special aviation projects section. For the past year he has been a partner in the engineering and sales firm of Walter Koelliker & Associates, Waterbury, Conn. **Alfred N. Lawrence** has been promoted to Aviation Division sales manager.

—o—

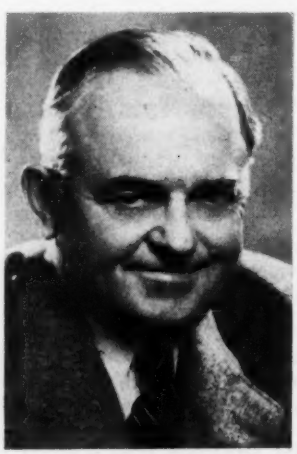
John W. Lawler, district manager, passenger car plant, American Car & Foundry Co., St. Charles, Mo., since 1922, has retired, after having been associated with the company and one of its predecessor companies for half a century.

—o—

Edwin M. Shultes III has been named counsel for the chemical department, General Electric Co., Schenectady, N. Y., succeeding **A. Cohen,** who will continue as patent counsel for the chemical department, with headquarters in Schenectady.

—o—

Dale Torgeson has joined the research department, Harbison-Walker Refractories Co., Pittsburgh. He for-

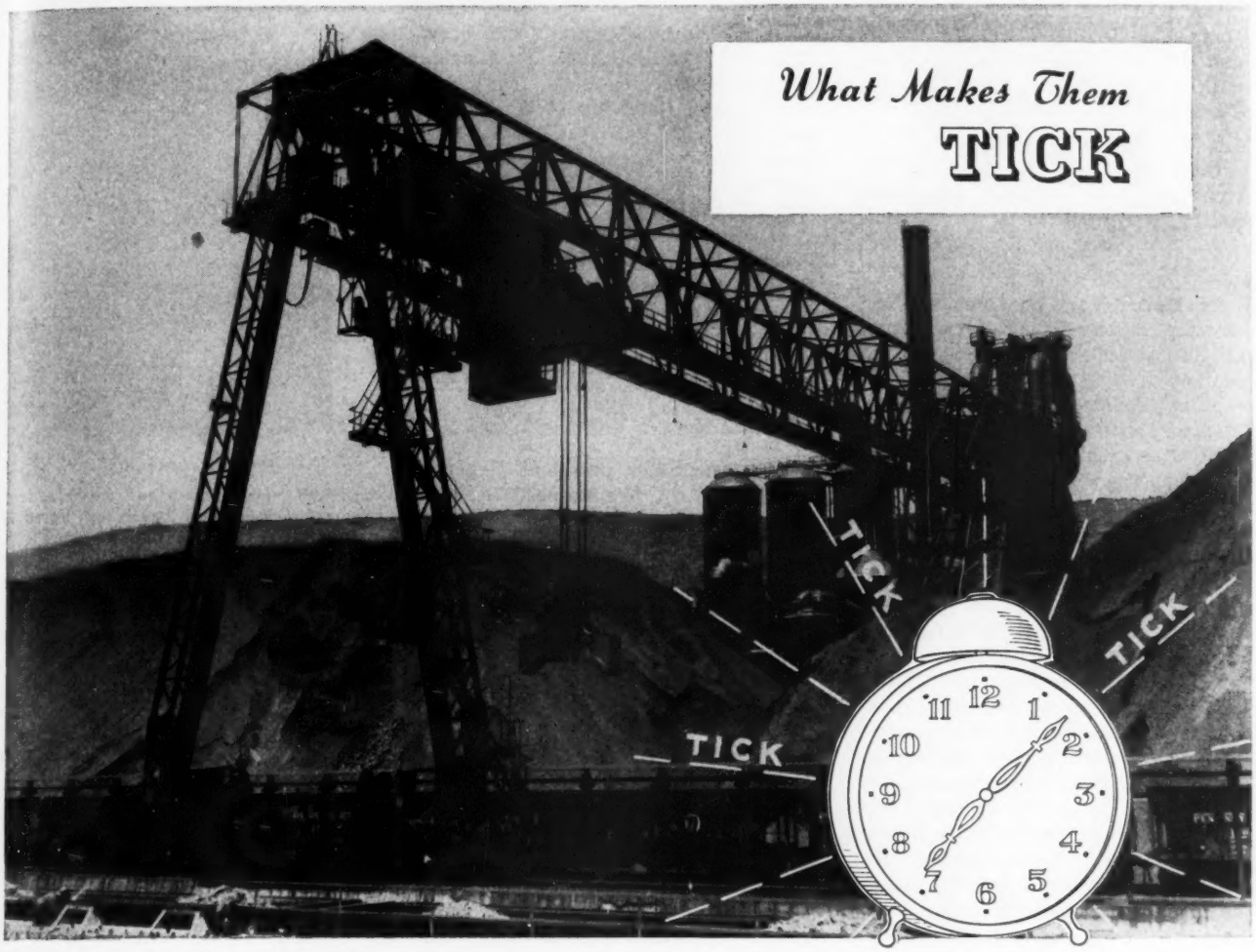


ERNEST BAXTER

Will retire June 1 as vice president, Sheffield Steel Corp., Kansas City, Mo., but will remain in a consulting capacity. Noted in STEEL, May 24 issue, p. 82

EUGENE W. FULLER

Elected vice president in charge of manufacturing and sales activities, Shakeproof Inc., Chicago, division, Illinois Tool Works. Noted in STEEL, May 24 issue, p. 82



at WEIRTON STEEL COMPANY?

When you visit the Weirton Steel Company, watch that man 90 feet above the ground, operating a Heyl & Patterson designed, built and erected Traveling Man-Trolley Ore Bridge. This bridge together with another H&P ore bridge handles the ore for Weirton's 3 blast furnaces.

Ask the operator of the Ore Bridge . . . ask the maintenance men who are responsible for blast furnace production . . . what makes this giant machine tick?

They have been living at Weirton with this H&P Ore Bridge since 1941 and with the other H&P Ore Bridge since 1926. They know what makes them tick. They'll tell you about their complete dependability for stocking, transfering and reclaiming iron ore . . . about low maintenance cost . . . ease of operation . . . sturdiness . . . weatherproofing . . . automatic rail clamps . . . and ever so quiet operation.

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Coal Preparation Plants
Coal & Coke Handling Equipment
Boat Loaders and Unloaders
Rotary Mine Car Dumpers
Coal Crushers
Coal Storage Bridges
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Thorsten Coal Samplers
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merly was chief chemist, Northwest Magnesite Co., at Cape May, N. J., and more recently was connected with the Bureau of Mines, Boulder City, Nev., and Berkeley, Calif.

—o—

Orrin E. Wolf has been elected vice president, Hotpoint Inc., subsidiary, General Electric Co., at Chicago.

—o—

Dr. Harold Vagtborg, president and director, Midwest Research Institute at Kansas City, Mo., since its inception in 1945, has resigned to accept appointment, effective Sept. 1, 1948, as president and director, Southwest Research Institute based in Houston, Tex.; as director of the Institute of Inventive Research; and as director of the Foundation of Applied Research; also as technical director of the 3500-acre Essar Ranch, all located outside San Antonio, Tex. Dr. Vagtborg will remain as president and director of Midwest Research Institute until July 1, at which time he will function in an advisory capacity until his permanent successor is appointed. **Dr. George E. Ziegler,** executive scientist, will continue as executive scientist, and will also take over the administrative responsibilities of Midwest Research Institute until Dr. Vagtborg's successor is announced.

—o—

Harry W. Brown has been appointed sales manager of the automotive department, United States Rubber Co., New York, succeeding **S. E. Abramson,** retired after 51 years of service. **E. J. Briske** has been appointed Detroit district manager of the automotive department. In recent years he served as an assistant to Mr. Abramson. In his new position, Mr. Brown will have general supervision over the sale of automotive parts, including rubber-to-metal and all-rubber molded parts, steering wheels and fan belts. He will be located at the company's Ft. Wayne plant.

—o—

George P. McCracken has been appointed district manager at San Antonio, Tex., Sheffield Steel Corp., succeeding **George P. Lacy,** recently appointed manager, railroad sales, with headquarters at Kansas City, Mo. Mr. McCracken served under Mr. Lacy for the past three years.

—o—

Officers elected to serve for the year 1948-49 for the Philadelphia Control, Controllers Institute of America, are: President, **E. L. Fortin,** Selas Corp. of America; vice president, **C. H. Yardley,** Penn Mutual Life Insurance Co.; secretary, **F. A. Greenwood,** Interstate Hosiery Mills Inc.; treasurer, **H. V. Arnaiz,** Hutchinson, Rivinus & Co. Directors elected are: **Raymond F. Bradshaw,** South Chester Tube Co., **F. R. Ehrmann,** Hellwig Dyeing Corp., **F. E. Michel,** United Parcel Service of Pa. Inc., F. G. **Roberts,** SKF Industries Inc., **Hugh J. Ward,** Pennsylvania Railroad Co., **C. E. Kley,** Edwin H. Fitler Co., **R. G. Bannister,** Petrol Corp., **W. H. Hurtzman,** First National Bank of Philadelphia, **A. L. McBride,** Charles Bond Co., **P. J. Geib,** National Refractories Co. Inc., and **D. P. Jones,** Sun Oil Co.

—o—

L. D. Harkrider, president, General Malleable Corp., Waukesha, Wis., has been elected president of the Wisconsin Manufacturers' Association. He has been vice president, and succeeds **William S. Grede** as president. **Robert A. Ewens,** who has been manager of the association, has been elected to the newly created position of executive vice president. **Col. H. J. Mellum,** secretary, Nash - Kelvinator Corp., was named vice president. **Rex Reeder** has been named treasurer.

—o—

John M. Bush, manager, land and lumbering department, Cleveland-Cliffs Iron Co., Cleveland, has resigned after serving the concern in Upper Michigan ore fields since 1901. He is succeeded by **Arthur J. Erickson.**

—o—

The recently incorporated Cornell Aeronautical Laboratory, Buffalo, has elected **Theodore P. Wright,** former member, Civil Aeronautics Administration, as president, and **Dr. Clifford C. Furnas,** laboratory director, as executive vice president.

—o—

Thomas Nast has been elected president and treasurer, Kensico Tube Co., Mt. Kisco, N. Y. He was associated for several years with Revere Copper & Brass Inc.

—o—

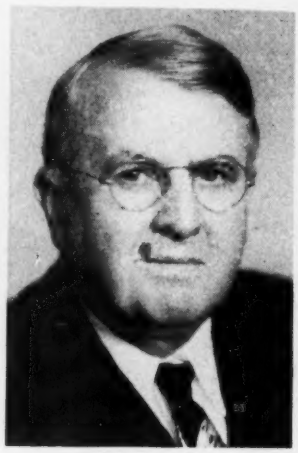
William T. Ennor has been named an assistant director of research, aluminum research laboratories, Aluminum Co. of America, Pittsburgh. He has been general staff metallurgist for the Fabricating Division.

—o—

Santa Fe Tank & Tower Co., Los Angeles, has announced the appointment of **A. M. Kuehmsted** to head its expanding Cooling Tower Division. He has been with the company for 12 years.

—o—

John K. McNeely, electrical engineer who for the past 25 years has



JAMES F. DONAHUE

Has been named executive vice president, Lamson & Sessions Co., Cleveland. Noted in STEEL, May 24 issue, p. 86

been closely associated with engineering developments in the aircraft field, has joined Jack & Heintz Precision Industries Inc., Cleveland, as special aviation project engineer. He has been chief electrical engineer at Harvey Machine Co., Los Angeles, since 1944, and electrical engineering group supervisor at Lockheed Aircraft Corp. for three years prior to that connection.

—o—

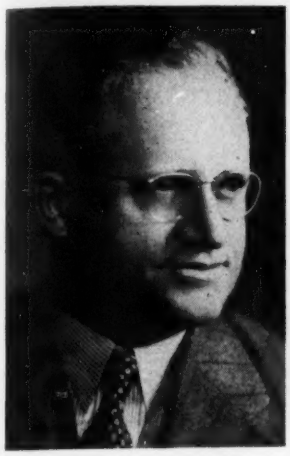
A. P. Levinson, secretary and general sales manager, Levinson Steel Sales Co., has been elected president of the Iron League of Pittsburgh, succeeding **Michael Pfaff,** Standard Metal Products. Other new officers of the Iron League, whose members represent the miscellaneous and ornamental iron industry in the Pittsburgh district, include: **Louis Blum,** Hyman Blum Co., first vice president; **Frank O. Wieland,** Rieger Iron & Wire Works, second vice president; and **Ralph E. Hughes,** executive secretary of the league, secretary-treasurer.

—o—

J. G. Harwick has been appointed chief accountant at the Spring Works, Crucible Steel Co. of America, Pittsburgh. He previously had been with the Crump Construction Co. **F. J. Hilsinger** has been appointed works controller at Harrison, N. J., for the Atha and Spaulding & Jennings controller's departments.

—o—

Gretta Scott, specialist in spectroscopy and x-ray diffraction work, has joined the staff of Hall Laboratories, Pittsburgh. She was in charge of radiography laboratory at American Radiator & Standard Sanitary Corp. from 1943 to 1945, and since the war has been on the natural sciences staff at the University of Pittsburgh,



WILLIAM L. DEAN

Elected president and general manager, Mathews Conveyor Co., Elwood City, Pa. Noted in STEEL, May 24 issue, p. 82

J. J. LINCOLN JR.

Elected president, International Acetylene Association. Noted in STEEL, May 24 issue, p. 84

R. L. CUNNINGHAM

Has been elected president of Ohio Ferro-Alloys Corp., Canton, O. Noted in STEEL, May 24 issue, p. 87

serving as research assistant in x-ray work.

—o—

Duraloy Co., Scottdale, Pa., producer of chrome-iron and chrome-nickel castings, announces appointment of **F. O. Nelson** as its representative for the Chicago district. He formerly had been representative for the Pittsburgh Metallurgical Co.

—o—

Ready-Power Co., Detroit, announces appointment of **William Wendt** as district manager for Texas, New Mexico, Oklahoma, Arkansas and Louisiana.

—o—

Frank G. Soule has been appointed purchasing agent for the general engineering department, National Lead Co., New York. He has been purchasing agent at the Sayreville plant for Titanium Division since 1934.

—o—

Rear Adm. Frederick W. Pennoyer Jr., U.S.N., has been ordered detached in July as Bureau of Aeronautics general representative, central district, Dayton, O., to assume duty as commander, Naval Air Material Center, Philadelphia, relieving **Rear Adm. Donald Royce,** U.S.N., who has served in his present command since Sept., 1944. Rear Adm. Royce has been ordered to New York as Bureau of Aeronautics general representative, eastern district. Both of these officers have been designated for aeronautical engineering duty only.

—o—

James B. Morrow has been elected to serve as president, Bituminous Coal Research Inc., succeeding **Howard N. Eavenson.** Mr. Morrow is first vice president, Pittsburgh Consolidation Coal Co., Pittsburgh.

—o—

W. Walter Williams, Seattle, has been elected chairman of the Committee for Economic Development, succeeding **Paul G. Hoffman,** who resigned following his appointment as administrator for economic co-operation. Mr. Hoffman also resigned as president of Studebaker Corp. following his appointment to head ECA. He continues as a trustee of Committee for Economic Development.

—o—

R. E. Kistler has been appointed sales engineer, fats and oils department, Chemical Plants Division, Blaw-Knox Co., Pittsburgh.

—o—

Two new sales representatives appointed by Osborn Mfg. Co., Cleveland, are **J. I. Hammond,** assigned to the central Pennsylvania territory, embracing the area between Reading and Altoona, and **E. M. Schoemmell Jr.,** assigned to territory including Maryland, Virginia, North and South Carolina, and Washington. Two new members have been added to the company's field sales staff, as follows: **Robert Ruthenberg** in the Chicago office, and **John D. Ashlin,** to the Detroit office. **Richard R. Schultz,** former expediter in the purchasing department of the company, has been named assistant to **J. G. Gamel,** advertising and sales promotion manager.

—o—

Judson S. Sayre, president, Bendix Home Appliances Inc., South Bend, Ind., has been elected vice chairman of the advisory council for the College of Commerce, University of Notre Dame.

OBITUARIES...

A. H. Ferbert, 65, president, Pittsburgh Steamship Co., Cleveland, ore-carrying subsidiary, U. S. Steel Corp., died May 23 following a two-week illness. He started with the company in 1904 as a stenographer, subsequently serving in the furnace order department for six years, and dispatcher from 1912 to 1922, when he was promoted to traffic manager. In 1924, Mr. Ferbert was elected vice president, and in 1940 he was elected president of the company. He was a director of Pittsburgh Steamship Co., as well as president and director of the Pittsburgh Supply Co.

—o—

Thomas H. Henkle, 64, pioneer in the development of streamlined trains, died May 21 at his home in Pacific Palisades, Calif., where he lived since his retirement in 1946 after 27 years of service with the Edward G. Budd Co. at Detroit and later Chicago.

—o—

James J. Hughes, sales agent in Chicago for the past 26 years for Ohio Steel Foundry Co., Lima and Springfield, O., McConway & Torley Corp., Pittsburgh, Davis Brake Beam Co., Johnstown, Pa., and Baltimore Foundry Machine Corp., died May 18.

—o—

A. Fred Morris, chairman of the board, Morgan Engineering Co., Alliance, O., died recently.

—o—

William C. A. Busch, 69, superintendent, construction department, Lukens Steel Co., Coatesville, Pa., died May 20.

—o—

Ralph W. Porter, vice chairman, Swindell Dressler Corp., Pittsburgh, died May 21. He also was treasurer, Industrial Furnace Mfg. Association.

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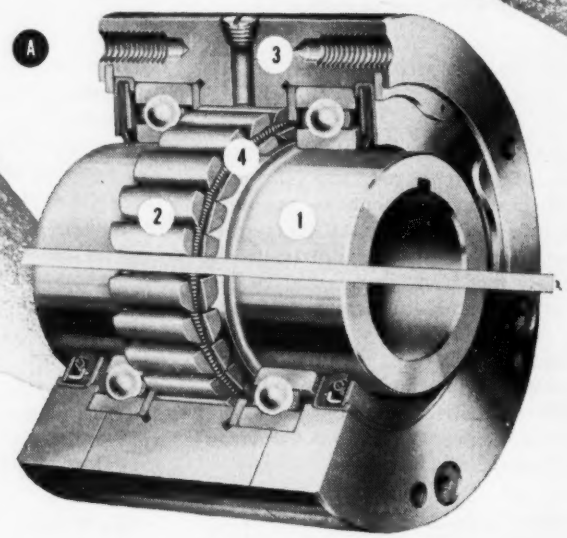
a new and complete line of

MORSE-FORMSPRAG

FULL COMPLEMENT OVER-RUNNING CLUTCHES

★ Instant Engagement
★ Instant Disengagement
★ Accurate Indexing
★ Positive Action



1. Inner Member 2. Sprag 3. Housing 4. Energizing Spring

A new principle in clutches . . .

BORROWING an idea from the wooden sprag that oldtimers used to prevent wagons from rolling backward, yet allowing free forward motion — Morse-Formsprag Clutches have come forth with the ultimate in Over-Running Clutch design.

Each Morse-Formsprag Clutch contains a full complement of sprags between inner member and housing. Contact between sprags is maintained by a circular pressure spring which acts as an energizing medium.

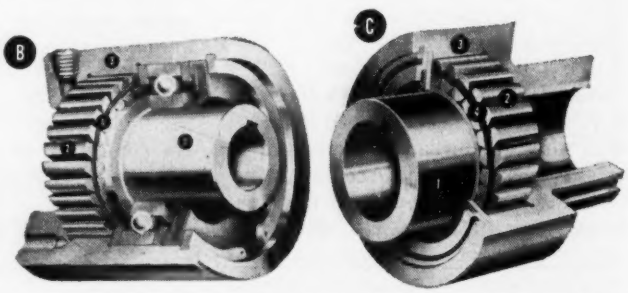
Because of the full complement of sprags used in Morse-Formsprag Clutches, localized stress is minimized. This design simplicity permits the greatest possible torque capacity for size and weight.

Three types of Morse-Formsprag Over-Running Clutches are available from stock—for indexing, over-running or backstopping:

A. All-Purpose Ball-Bearing Type.
B. Indexing and Backstopping Ball-Bearing Type.
C. Plain-Bearing Type.

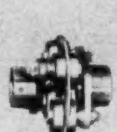
These three types are carried in stock with a variety of finished stock bores ready for immediate use. Special sizes and designs can be furnished to fit your requirements.

For detailed information, installation suggestions and ordering data, write Dept. 188 for Morse-Formsprag Catalog C11-42. Address: Morse Chain Company, 7601 Central Avenue, Detroit 8, Michigan.



1. Inner Member 2. Sprag 3. Housing 4. Energizing Spring

Roller Chain Drives



Morflex Couplings

Morse Silent Chain Drives

MORSE

MECHANICAL *POWER TRANSMISSION* PRODUCTS

A PRODUCT OF B-W BORG-WARNER

Morse-Rockford Over-Center Clutches

MORSE CHAIN COMPANY • DETROIT 8, MICHIGAN

Engineering News . . . AT A GLANCE

PROVIDES CONTINUOUS POURING—A two-chamber unit that permits continuous pouring is one of the latest developments for nonferrous melting. In the induction furnace designed by Fisher Furnace Division of Lindberg Engineering Co., Chicago, the charging chamber is connected to the pouring chamber by a series of straight-line melting channels. Adding cold metal to the charging chamber does not affect the temperature in the pouring chamber. All residue either floats on the surface or sinks to the bottom of the charging chamber so that only clean metal reaches the pouring section.

"PLUG-IN" PRESS—Production kinks in the assembly line of Midwest Mfg. Co., Galesburg, Ill., are "ironed out" by a versatile mechanically-operated Multi-Max press, a 30-ton combination shear and press, supplied by Parker Mfg. Co., Santa Monica, Calif. The machine, which needs no special foundation, is easily picked up and moved in and out of the production line as needed. Finished parts can be fabricated right at the point of assembly in required amounts. This "plug-in" advantage enables the unit to be taken to the work, rather than depending upon the work being brought to it.

PACKAGED RADIOCHEMICAL COMPOUNDS—Substantial contributions to more extensive use of radioisotopes in research is expected to be achieved in a new co-operative venture between the Atomic Energy Commission and private industry. The former recently enlisted the services of Tracerlab Inc., Boston, to manufacture and stock a number of compounds tagged with carbon-14. The company is commencing this work with 100 millicures of carbon-14, reported the largest shipment to be made thus far from Oak Ridge to a single customer. Prices have not yet been determined, but it is expected that they will be in the range of $200 to $500 per millicurie for most compounds.

OUTWARD FORCE MEASURED IN TONS—In Springfield, Vt., Bryant Chucking Grinder Co., which builds high-speed grinding spindles for its internal grinders, is experimenting with a motor that runs at a speed of 204,000 revolutions per minute. Such speeds are desirable for grinding holes under 1/16-inch diameter. The unit is a 3-phase induction type motor operating on 3400 cycle current. Its rotor is integral with the grinding wheel spindle and is carried on ball bearings that are oil-mist lubricated. Rotor surface travels about 600 miles per hour and the outward force is measured in tons. The motor is not expected to be marketed for some time.

MECHANICAL WELDING AID—Use of jigs enables one Midwestern manufacturer to employ downhand position in nearly all finish welding in joining stainless steel triangular segments that eventually form a steam-jacketed kettle. According to Chicago Steel Service Co., Chicago, the stainless segments ranging from 16 to 10 gage are first assembled and tack welded. The assembly then is placed on a ring fixture. This supports the pieces with the seams facing the operator for the inside welding operation. By rotating the shell on a vertical axis he can do all welding downhand. For outside seams, shell is placed on a rotating disk which is affixed to a pipe support in such a way that the seams are presented in nearly a horizontal position.

"CLEANING" TOO ALL-INCLUSIVE—Strictly speaking, the term "cleaning" as applied to the preparation of metals for finishing, should be limited to the removal of dirt, oil and grease without chemical or mechanical change in the surface characteristics. Any method of preparation that changes the surface of the metal is likely to have a positive effect on the adhesion and resultant durability of applied organic coatings. Thus, it is advisable to distinguish between cleaning and methods that actually change surfaces for better bonding. (p. 56)

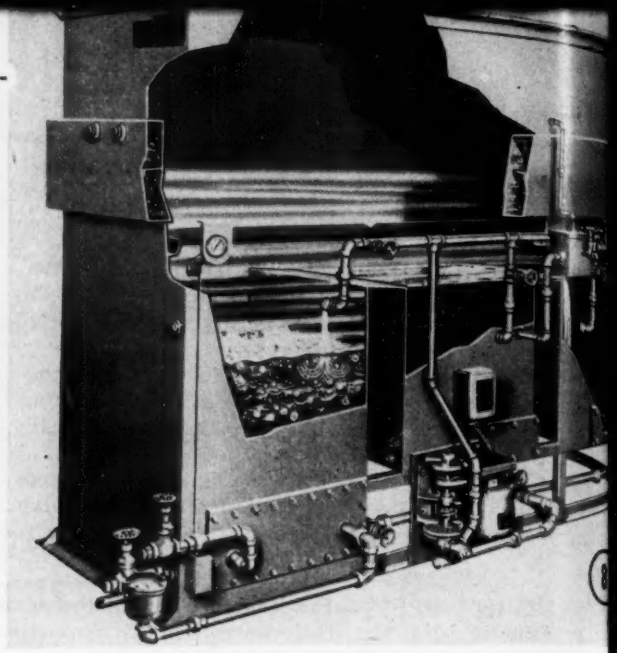
SCRAPS OLD ASSEMBLY METHODS—Complete upheaval of established techniques in the assembly of auto bodies resulted with the appearance of the so-called Monobilt body on the production lines of Hudson Motor Car Co. It led to development of a system of building an integral body structure comprising longitudinal, transverse and vertical framing members, roof, side stampings and floor panels—all welded into one rigid unit. (p.60)

TEAM DECISIONS—Time study teams are used in the plant of Oliver Iron & Steel Corp. to review operations in furthering production and controlling operating costs. Consisting of management and union representatives, the teams leave no stones unturned in covering assignments. Before proceeding with its job, for example, each team reviews comparable operations in the files or on master time standard data forms in that or other departments. In addition, methods used by the operator, location and layout of material and tools are analyzed. (p. 63)

FLUX SPOTTING—When working with a zinc ammonium chloride flux wash in sheet galvanizing, temperature adjustments call for careful study, and increases of concentrations should be made cautiously. If there is an adequately deep fusion in the flux box so that the flux film is brought up to fusion before, or as it reaches the molten zinc, low flux wash temperatures are preferable. At higher speeds this may not be practical, therefore, some heating may be required in the flux wash to save time in creating fusion in the box. Great care must be taken to prevent small pores from appearing in the dried flux film. (p.86)

Organic Finishes

For Metal Products



Part two of the current series, this section is devoted to methods of cleaning and preparing surfaces prior to painting, and to formation of phosphate coatings on steel

A VARIETY of industrial methods are utilized for cleaning and preparing metals for painting. Strictly speaking, the term "cleaning", as applied to preparation of metals for painting, should be limited to the removal of dirt, oil and grease without chemical or mechanical change in the surface characteristics. Any method of preparation which changes the surface characteristics of the metal is likely to have a positive effect on the adhesion and the resultant durability of applied organic coatings.

For this reason it is advisable to distinguish between cleaning and other methods of metal preparation, which either chemically or mechanically change the characteristics of the surface. The most widely used methods of preparing metal products for organic coatings may be classified as follows: I. Methods which do not materially change the surface characteristics of the metal. II. Methods which mechanically or chemically alter the surface characteristics of the metal. III. Methods which convert metal surfaces to a nonmetallic coating adapted to inhibiting corrosion and increasing the adhesion of applied organic finishes.

Group I includes various types of alkali, emulsion and organic solvent (trichlorethylene) cleaning which constitutes the simplest methods used in preparing metal for organic coatings. These methods provide only for the removal of foreign matter, grease and oil, without imparting any material change in the surface of the metal. The greatest possible success obtainable, from the use of such methods, is an absolutely clean metallic surface which does not provide for inhibiting corrosion or increasing the adhesion of applied organic coatings.

Most effective solvent cleaning process is the chlorinated solvent vapor degreasing process. The suppliers of chlorinated solvents and equipment for solvent vapor degreasing furnish instructions for the care of the solvents, operation of equipment and maintenance. Shown in Figs. 8 and 9 are modern type vapor degreasing machines for use in finishing operations on metal products.

Alkaline spray cleaning is done in mechanical washing machine such as shown in Fig. 10, which employs a conveyor or belt to transport the parts through the cleaning, rinsing and preferably the drying stages. An example[6] of a simple cleaner which has been used in such types of cleaning machines is given below:

Soda Ash	30 per cent
Tri-Sodium Phosphate	60
Caustic Soda	10

Single compounds such as sodium orthosilicate, tetra sodium pyro phosphate, and trisodium phosphate have been used with satisfactory results. There are a number of trade name cleaners on the market which will do a good job and which may be designed to fit the particular cleaning problem through the assistance of technical service representatives. Selection of a cleaner should be based on cleaning ability and economy. The rinsibility or ease of rinsing of the cleaner composition from the surface is an important consideration in the selection of a cleaner, as no trace of chemicals should be left on the surface for organic coating operations.

Alkaline cleaner solutions for immersion cleaning of steel are generally made up within the limits of 6 to 10 ounces of cleaner per gallon of water and operated at elevated temperatures up to the boiling point of the solution. Various combinations include the types previously mentioned, such as caustic, soda, trisodium phosphate, and soda ash mixture, and the soluble sodium silicates.

Immersion time for satisfactory cleaning will vary

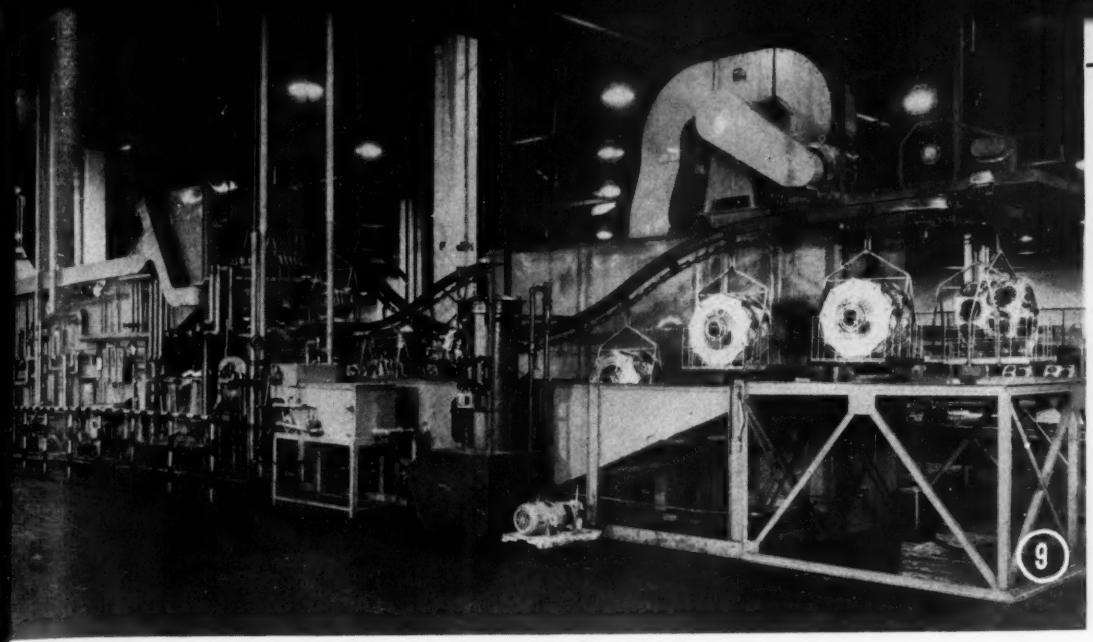


Fig. 8—Cutaway view of a hand-operated three-dip immersion degreaser. Work is first immersed in the boiling solvent, shown in chamber at left, and then in clean solvent rinse, center chamber, and finally into pure solvent vapors for finish cleaning action, in the last chamber. Courtesy Detrex Corp.

Fig. 9—Large mono-rail conveyorized through-type vapor-spray-vapor degreaser, used in the continuous production cleaning of metal parts

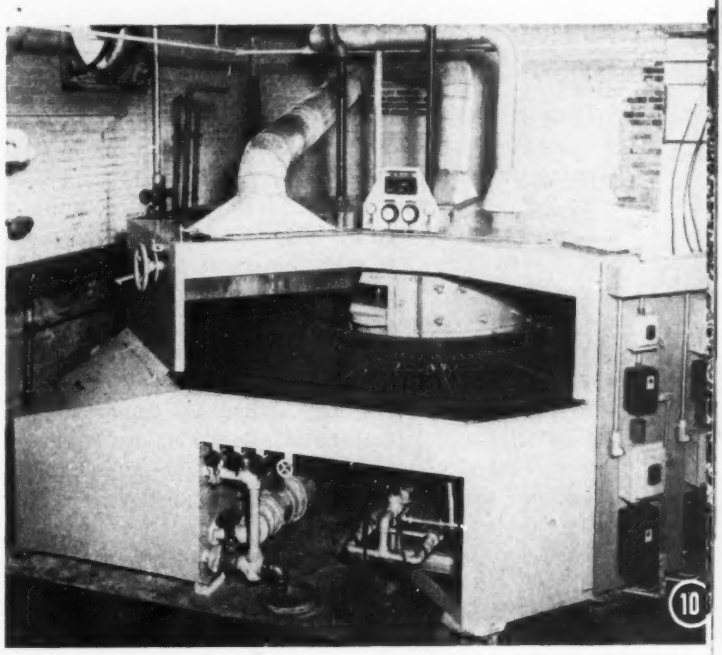


Fig. 10—Typical roto table washing, rinsing and drying machine. Work being processed is placed upon the table and carried through the various processing chambers, returning finally to the loading place. These machines have the advantage of occupying a minimum of floor space. Courtesy Metalwash Machinery Corp.

with the degree of contamination, but usually requires 5 or more minutes. Overall cleaning time can be reduced by a water spray rinse, after partial cleaning, followed by a second immersion. Thorough rinsing should follow immersion cleaning to remove all alkaline materials.

Group II methods of surface preparation include mechanical means such as sand and shot blasting, which roughen metal surfaces so that organic coatings will more readily adhere. Included in this same group are chemical methods of preparation, such as ordinary acid pickles, and others, involving the use of phosphoric acid and a grease solvent to clean and etch the metal surface to provide better adhesion of applied paint finishes.

These methods impart a roughness to the metal surface which increases initial adhesion of applied paint finishes but does not provide any appreciable protection for inhibiting corrosion of the metal. It is generally considered that because of the increased activity of metal prepared by these surface roughening methods, it tends to corrode rapidly, and metal so prepared should be painted as soon as possible following the treatment.

Metal products are generally freed of oil and grease before they are sand shot blasted. This precaution prevents the abrasive material from becoming contaminated and the grease from being driven into the metal. In shot blasting, it is particularly necessary to avoid contamination of the shot, to obtain a grease-free surface which will provide good paint adhesion. Ordinary acid pickling removes scale from metal and etches the surface. The operation should be followed by a thorough water rinse to insure the removal of any adhering salts from the metal.

Primary factor in pickling is to remove scale and to etch the metal surface and provide better adhesion for the final paint finish. Acid cleaning of metal with phosphoric acid and a grease solvent provides for the removal of grease and the etching of the metal surface in one operation. Application of such cleaning methods is generally by hand, and the human element is a factor in the successful operation of the process. Following the acid cleaning operation, it is customary to rinse the metal and dry it thoroughly before painting.

Group III methods of surface preparation include those processes which convert metallic surfaces to a nonmetallic coating which inhibits corrosion and increases the adhesion and resultant durability of applied organic coatings. This method of metal prep-

Fig. 11 — Cleaning and rust-proofing machines on three automobile production lines. Courtesy R. C. Mahon Co.

Fig. 12—Simple immersion type setup for phosphate coating

Fig. 13—Change in surface of steel after application of a commercial phosphating process,

aration requires the removal of all grease and foreign matter from the surface of the metal by the methods of Group I or II, prior to the formation of the protective conversion coating on the surface. Instead of activating the metal, such as results from acid etching and mechanical blasting, the surface is converted into a more stable and less reactive medium as a base for paint. Thus, because of the increased resistance to corrosion, metal products prepared for organic coatings by the use of conversion coatings do not have to be painted immediately.

Phosphate coatings for use as a base for paint are usually applied after fabrication of articles and immediately before painting, either by immersion of the article in the phosphating solution, or by spraying the solution onto the articles to be coated. Fig. 11 shows the processing of automobile bodies. Fig. 12 shows a simple immersion type set-up for phosphate coating. In general, very small parts which can be more conveniently handled as a unit load, are treated by immersion application while larger parts such as refrigerator cabinets, automobile bodies and fenders are treated by spray application. The immersion process requires 2 to 5 minutes for application of the coating and the spray process 45 seconds to 1 minute.

Difference in the surface of cold rolled steel and similar steel after phosphate coating is shown in Fig. 13. In addition to giving increased adhesion of paint finishes, this coating reduces the activity of the metal, thereby preventing underfilm corrosion at the paint metal interface, and at the same time prevents the spread of corrosion from scratched or abraded areas in the paint film.

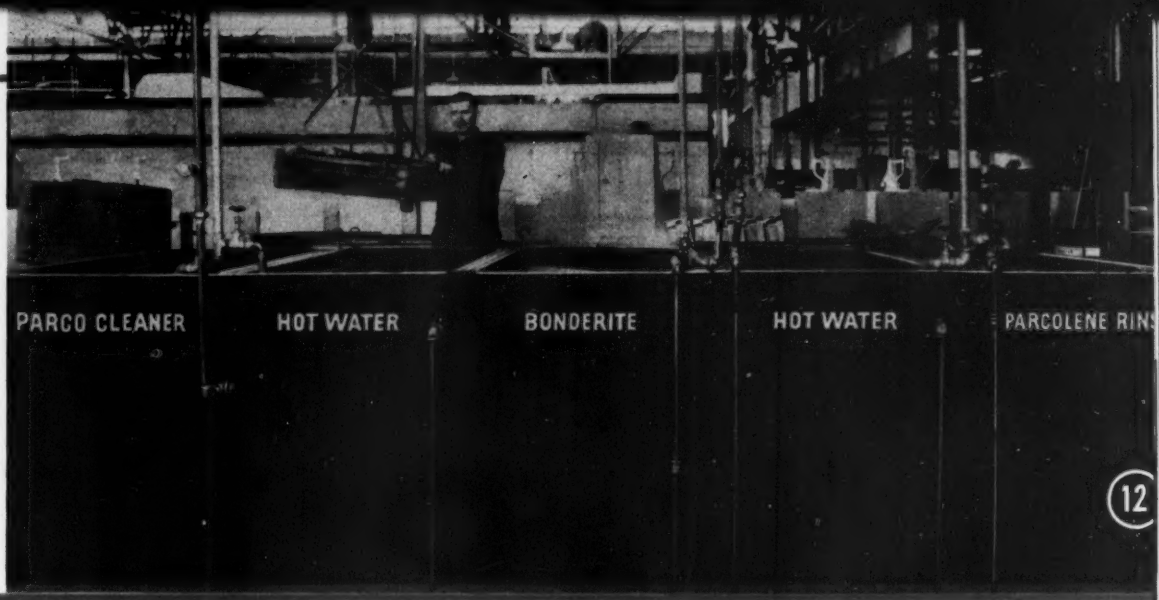
Formation of Phosphate Coatings On Steel—First commercial use of phosphate coatings followed the proposal of Coslett of England, in 1908, to treat iron and steel articles in a dilute hot phosphoric acid solution with a control agent such as iron filings.[7] This process[8], later modified and considerably improved, contains the fundamental principle on which the more recent methods of phosphating are based. The Coslett process was founded on the fact that phosphoric acid will dissolve ferrous phosphate within certain definite limits in direct proportion to the acid present.

Immersion of properly cleaned iron and steel articles in a dilute phosphoric acid solution saturated with ferrous phosphate results in the formation of a crystalline phosphate coating with the metal at the point of solution. Reaction of the acid with the metal takes place with the evolution of hydrogen gas until the metallic surface is completely converted to a protective phosphate coating. Cessation of gassing indicates the surface of the metal is completely converted to a phosphate coating.

Time required in the formation of phosphate coatings on articles by the Coslett process, 2 to 2½ hours, materially restricted its use. To provide a more practical process, Richards[9] introduced the use of manganese as a control agent and a constituent of the bath and coating. Difficulty in maintaining the phosphating bath in balance as to the ratio between free and combined phosphoric acid was a distinct disadvantage of the Coslett and Richards processes.

To overcome this difficulty and provide a balanced phosphating bath as to ratio between free and combined phosphoric acid, crysals of manganese di-hydrogen phosphate were used in the preparation and operation of the phosphating process known today as Parkerizing.[10] The metal phosphates of iron, manganese, and zinc, in dilute phosphoric acid solutions are most commonly used for producing phosphate coatings on metals.

Further work was carried out aimed at reducing the time required for treatment. To expedite the formation of phosphate coatings on metals, a small amount of copper[11] was employed in the bath, in 1929, which reduced the time of coating formation from 1 hour to 10 minutes. This method of producing phosphate coatings on metal surfaces became known as Bonderizing[5] and has since become a widely used method of preparing metal products for organic coatings. The reduced processing time enabled metal stampings to be hung on a conveyor and drawn



known as Bonderizing; (A) untreated, (B) phosphate coated

Fig. 14 — Comparison of (B) phosphate coating as applied to fabricated articles with (A) phosphate coating which will withstand forming as applied to sheet or strip. Bonderizing was used. Courtesy Parker Rust-Proof Co.

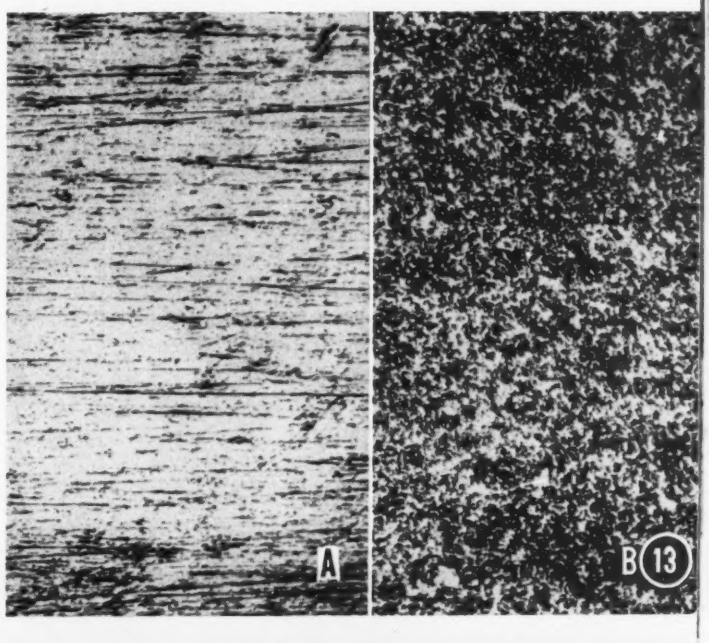
through the phosphating bath for coating in completely mechanized equipment.

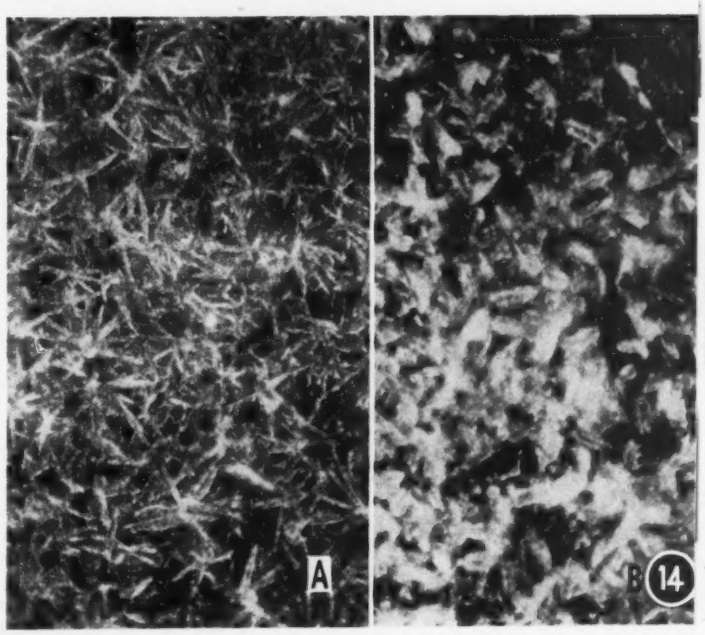
Use of phosphate coatings as a base for paint was well established by 1930 and it was apparent that the time required to produce such coatings should be reduced if it was to gain wide industrial application. Addition of an oxidizing agent[12], such as nitrate, to the phosphating bath, was found to expedite the coating by preventing the formation of a hydrogen film on the surface of the metal and thus permitting the solution to come in direct contact with the metal surface. In 1931 this development was made available for commercial use and the phosphating process embodying the use of an oxidizing agent reduced the time required in forming suitable paint base coatings from 10 to 5 minutes.

Knowledge gained from the use of the phosphating process containing an oxidizing agent resulted in a further improvement[13] in which the coating metal of the bath was increased in proportion to its phosphate content, resulting in a reduction in the time to produce paint base coatings, from 5 to 2 minutes. The reduced processing time required by this treatment made possible increased production with less equipment and floor space required.

A revolutionary advance in the application of phosphate coating of metals prior to organic finishing was first used commercially in 1934 and involved spraying the phosphate coating solution onto metal objects instead of the objects being immersed in the phosphating bath. Use of zinc phosphate solution and the oxidizing agent in the spray resulted in a much shorter processing time, namely, 45 to 60 seconds, and at a lower solution concentration and temperature than had ever been practiced by immersion processes. The spraying of the phosphating solution containing an oxidizing agent onto the article to be coated produced a cleansing action and to some degree accelerated the coating formation.

Due to the short processing time required in the formation of phosphate coatings by spray applications, the size of the equipment and floor space required in operating the (*Please turn to Page* 90)





BODY BUILDING AT HUDSON

By A. H. ALLEN
Detroit Editor, STEEL

New Assembly Approach

Used To Build Rigid Integral Units

PROBABLY the biggest manufacturing story to hit the automotive industry in many a year was the almost complete upheaval of established techniques and equipment by Hudson Motor Car Co. for the introduction of its so-called Monobilt bodies. Started last fall, the program called for expenditure of $16 million for installation of acres of new equipment, rearrangement of production lines and the training of employees in new methods and procedures used on the line.

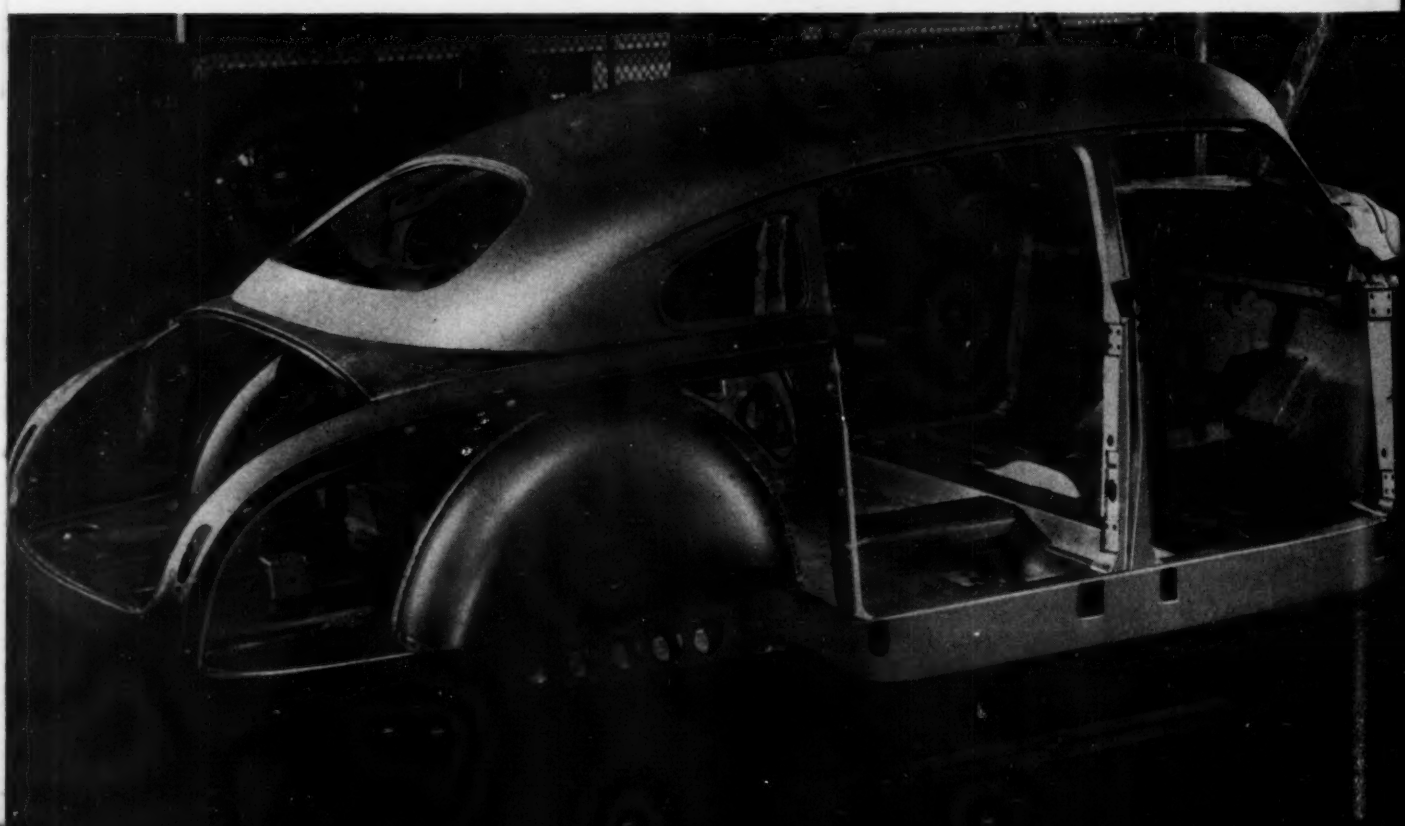
Briefly, the new Hudson body design centers around four principal goals—(1) Lowering the center of gravity by several inches to achieve greater safety and beauty of line; (2) more efficient use of interior space; (3) rearrangement of seating to "cradle" passengers between front and rear heel lines to improve riding qualities; and (4) provision of a more rugged basic body structure.

Realization of these aims called for scrapping old assembly methods entirely and the development of a system of building up an integral body structure comprising longitudinal, transverse and vertical framing members, roof, side stampings and floor panels—all welded into a rigid unit. Engine is carried on a forward subframe, bolted and welded to underfloor frame members of the body after the latter are assembled, painted and shipped from the separate Hudson body plant to the main assembly line.

Power "package," including the front suspension, steering mechanism, radiator, is built up separately, in contrast to the usual practice of building the entire chassis and then lowering a body on it, to be bolted in place.

Since principal interest attaches to the body manufacture, a series of illustrations is presented herewith showing many of the steps involved.

Completed body in white, except for rear fenders



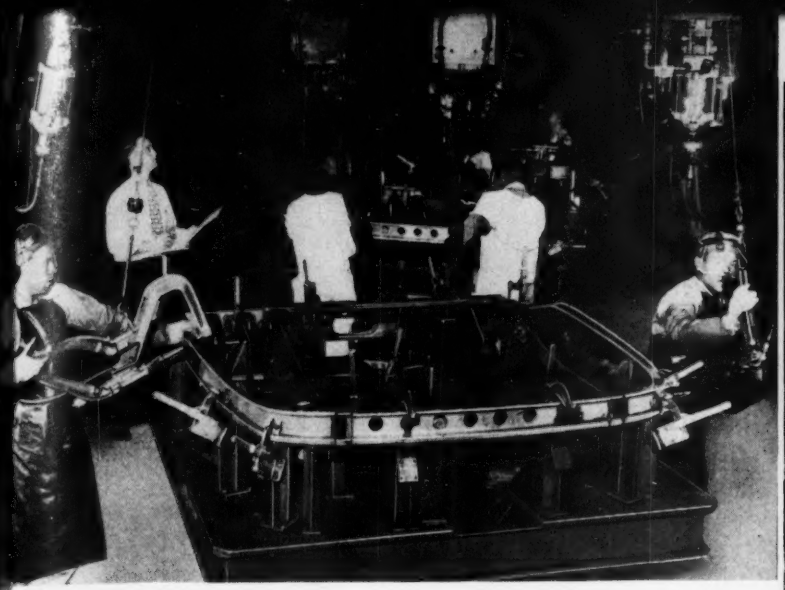


Fig. 1—Starting point of body assembly is this rear-frame merry-go-'round, with cars carrying precision-built fixtures into which frame stampings are clamped securely and spot welded. Frame at this point is upside-down. Note how outer frame member is carried around the rear and welded to the inner longitudinal box-section members. Welding transformers are supported on overhead monorails

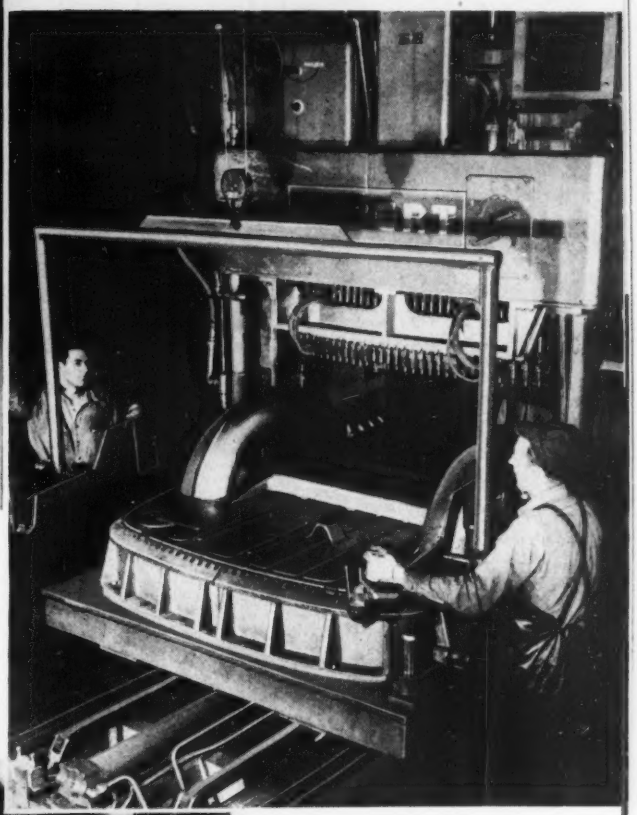


Fig. 2—A multiple-spot welder of the hydromatic type which, in a 45 second cycle, welds the hundreds of spots required to assemble the rear floor pan to the frame. Note the sheet steel wheel housings at either side of the piece. Welder has a shuttle-type base, permitting parts for one assembly to be positioned while the other is being welded. All electrodes lower to welding position simultaneously and are "fired" in groups of seven or eight

Fig. 3—Rear frame and underbody, still upside down, is transferred to another merry-go-'round where it is attached to the front frame and underbody. Outer side-rail sections traveling on the carriage are subsequently welded to the outer channels to form a full box section. Before moving to the final framing merry-go-'round, the assembly is placed in a trunnion fixture

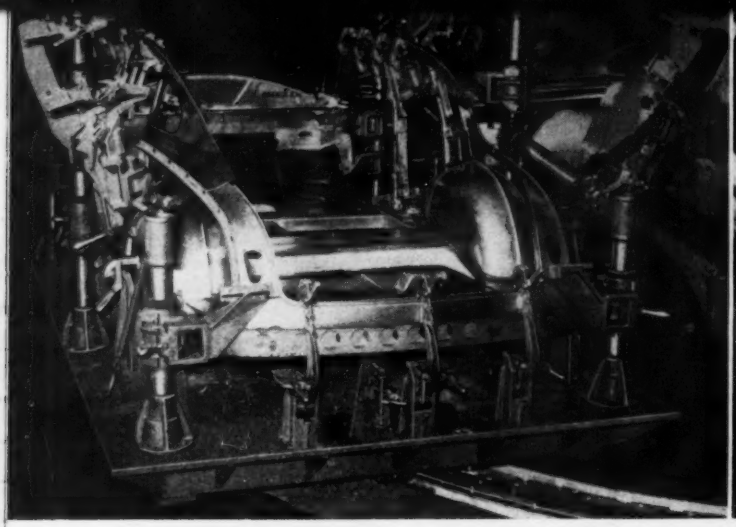


Fig. 4—Rear view of one of the main framing fixtures where roof, side panels and cowl are welded to the completed underbody. There are eleven of these fixtures on the conveyor loop which is geared to produce 40 bodies per hour. It is one of two, handling four-door bodies, while the second handles coupes and broughams. The fixture is often referred to as a balloon jig, with dozens of clamps holding the various components firmly in place while they are welded

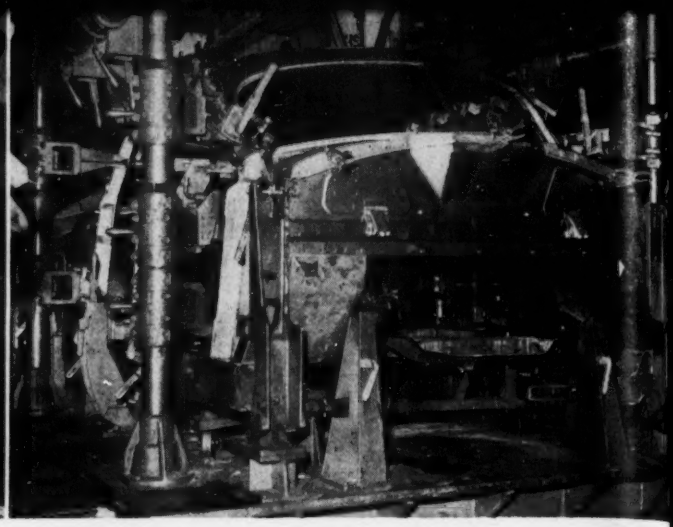


Fig. 5—As the body travels along the main framing loop, it enters a forest of welders which secure the principal sheet metal members with thousands of spot welds. Roof stampings are stamped from a single 70 x 130-inch sheet of 20-gage cold-rolled steel. Shown here is main framing fixture, with body in position—the heart of the entire unitized body-frame manufacturing technique. It is a modernized adaptation of the old balloon jig used in conventional body manufacture. Base is actually a machined surface plate. Vertical tubular members with clamping arms are held to close limits to assure perfect location of door, deck lid and windshield openings, as well as proper alignment of underbody side panels, roof and cowl assembly, during the welding operations. Each completed body requires over 5300 separate welds

BODY BUILDING AT HUDSON

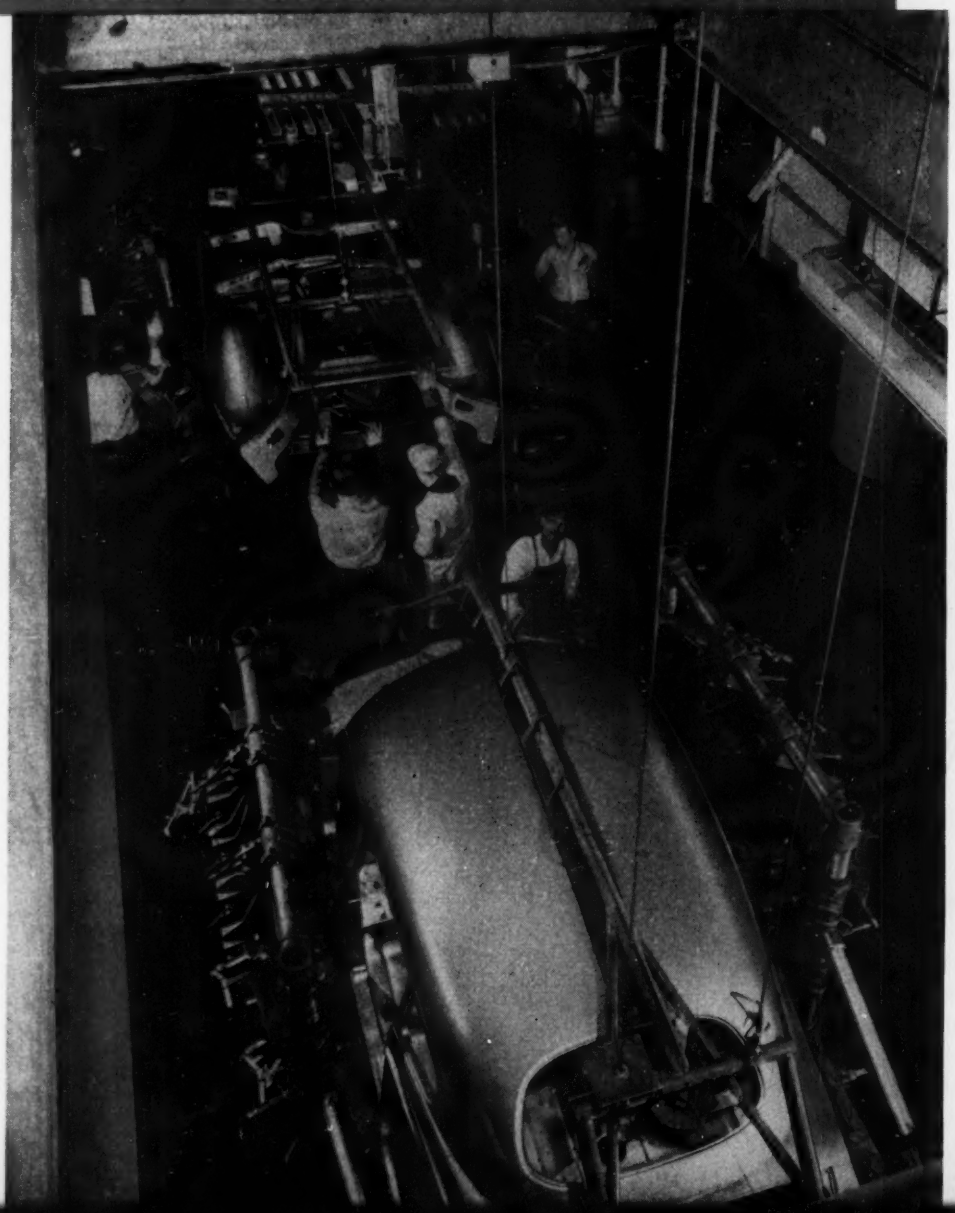


Fig. 6—When the body has made a full circuit of the main framing merry-go-'round it is spotted under this body lift which hoists it out of the framing fixture to the floor above. Here it is placed on a conveyor line for metal finishing operations such as grinding, soldering, filing and additional welding work. Components for another body are immediately placed in the vacated fixture. On the metal finishing lines for bodies in the white, crews with portable and power tools grind and sand out high spots, while others fill seams with solder, attach rear fenders, make weld reinforcements, install interior brackets and metal braces—all preparatory to spray painting and baking

Wage Incentives Based on Careful Time Studies

By RAYMOND T. WALTON
Industrial Engineer
Oliver Iron & Steel Corp.
Pittsburgh

INCREASE PRODUCTION and CONTROL COSTS

Operational reviews by management-labor time study teams have improved output up to 300 per cent on some jobs at Oliver Iron and Steel

ESTABLISHMENT of wage incentives based on a time and motion study program should be approached on a long range basis for most industrial operations to assure best results in increased production and control of operating costs. In describing the procedure for establishing an incentive standard, the easiest method would probably be to follow a process flow chart.

Requests for a time standard may come from three sources: 1. Management is concerned about the cost of a specific article or item and requires development of methods and procedures to reduce costs. 2. A foreman may have a rush job and is faced with delays in the manufacturing operations. He may request the time study department to review and set a time standard so the employees will increase production to expedite completion of the order. 3. Operators usually working on incentive jobs may get several jobs that are on a day work basis, which affects their pay adversely. They may request the foreman to inquire into the possibility of having the jobs set up on an incentive basis with the idea of increasing their earnings.

At Oliver, the time study department receives a phone call, verbal or written orders from the general manager or superintendent, or may receive a foreman's request for a time study, Fig. 1. These requests are reviewed by the industrial engineer and time study supervisor to determine priorities. An

Fig. 1—Request for task or time study starts procedure for establishing an incentive standard

Fig. 2—Copies of this standard hour task sheet are sent to payroll and estimating department, union, grievance man, timekeeper, foreman, and to the general manager

Fig. 3—Full cone pointing one end of ⅝-inch hanger bolts

REQUEST FOR TASK OR TIME STUDY

DATE OF REQUEST Dec. 27 19 45 — OLIVER IRON AND STEEL CORPORATION

DEPARTMENT TC-128 #2 — MACHINE CLASS & NO. 57-2186

PRODUCT NAME 5/8" Hanger Bolts — PRODUCT OR CODE NO.

OPERATION NAME Full Cone Pointing — OPERATION NO. 18

REMARKS: Full cone pointing - vise grip work.

Duplicate 1-10-46 — SIGNED Al Froehlich, FOREMAN

DATE RECEIVED Dec. 30 19 45 — (1) TIME STUDY DEPARTMENT — DATE COMPLETED Jan. 4 19 46

STANDARD HOUR TASK SHEET

OLIVER IRON AND STEEL CORPORATION — DATE October 2 19 45

DEPARTMENT TC-128 #2 — MACHINE CLASS & NO. 57-2186

OPERATION NAME Full Cone Pointing — OPERATION CODE 18 — T. S. NO. 2997

STANDARD HOURS PER 1000 pcs. 2.30 — STANDARD TASK PER HOUR 435 Pcs.

Vise Grip Work

PRODUCT NAME 5/8" Hanger Bolts — PRODUCT CODE

REMARKS: The above standard applies to one operator and includes: handle and point bolts; get supply of oil; dip each bolt before pointing; rake down bolts in bin; get tote boxes; wait for die-setter to change tools; make minor adjustments.

SIGNED TIME STUDY SUPERVISOR — DATE EFFECTIVE October 2, 1945

DATE APPROVED INDUSTRIAL ENGINEER — (2) GENERAL MANAGER IN CHARGE OF OPERATIONS

FORM NO. PE 1 SM 10-46

TIME STUDY SHEET

OLIVER IRON AND STEEL CORPORATION

DATE 10-1-45

DEPT. AND STUDY NO. TC-128 #2

STUDY MADE BY W. S. Van

SHEET NO. 1 OF 3

APPROVED

DATE

PART NAME Hanger Bolts 4" x 9/16" Rolled to 5/8" DWG. NO. PART NO. X-9087 Rev.

OPERATION AND DESCRIPTION Cone point Hanger Bolts (vise - one end) OPERATION NO. #18 D2

OPERATOR Larry Chiocca CHECK NO. 4586 HELPER None CHECK NO.

MACHINE USED Hand pointer 2" heavy duty single spindle NO. 57-2186 LEVELING FACTOR: SKILL 115 EFFORT 110

MACHINE DATA: FEED Hand R.P.M. 352 S.P.M. S.F.M. HEATING TEMPERATURE LOAD SIZE

TOOLS USED High Speed LXX and R[illegible]

TIME STUDY: START 8:30 A.M. P.M. FINISH 9.06 A.M. P.M. TOTAL TIME 36.15 Min. SIZE OF RUN 10,060 PCS. STUDIED 330

Bolts - S.A.E. 1020

4

analysis is made of the various departments regarding the degree of time study coverage.

Those departments that have practically all the jobs performed on an incentive basis normally receive preference. This is done to maintain as nearly as possible, an entire department on an incentive basis. The supervisor assigns specific jobs to time study teams, which at Oliver consist of management and union representatives. Normally, the schedule is established on a 3-month basis for each of the four teams in the department.

At the time of the inception of the wage incentive program in 1941, management and union representatives developed standards individually. On Jan. 2, 1947 the four-team arrangement became effective on recommendation of S. G. Yulke Co., management consultants.

Time study teams are assigned to review comparable operations in the files or on master time standard data forms in that department or other departments before proceeding to make a study. After analyzing this information, the team proceeds to the assignment.

An attempt is made to take the foreman to the job. However, if he is not available, the time study men notify either the timekeeper or the foreman's assistant. The grievance man in the department is also notified verbally and the subject reviewed and discussed with him. The time study team then proceeds to the operation and discusses the reason for a time study with the operator or operators involved.

The team watches the operation for several cycles, depending on the length of time consumed. This may vary anywhere from hundredths of a minute to several minutes or even to hours. Methods used by the operator, location and layout of material and tools used are analyzed before starting the time study. Any obvious changes and corrections are noted. The foreman is consulted before the study is initiated.

If the changes and corrections are of a minor nature and can be accomplished in a relatively short period of time, the time study men remain on the job until these corrections are made, and then begin the study. However, if the changes are involved, the team proceeds to another job until notified that the suggested changes have been made.

Purpose of the initial joint review of the operation is not only to determine the proper method but also the skill and effort shown by the operator. The team must agree as to the proper rating of the employee both in skill and effort as well as the method. Ability of the team to recognize and agree on ratings has been developed by intensive training and periodic refresher tests on skill and effort rating.

Basic standard of 3 miles per hour for walking, and normal shop operations shown on a projection screen, developed by Dr. Ralph M. Barnes, professor of industrial engineering at University of Iowa, plus movies developed by Methods Engineering Council and practical shop demonstrations are used in developing this judgment. This rating ability is further reviewed in the time study office with standard comparative data, and after considerable discussion both men agree as to the proper rating of the time taken, to extend the time allowed for each individual element and the total cycle time.

After the studies are completed, the men return to the time study department and make the computations necessary and arithmetical breakdown of the time study and analysis of the operation. Blueprints and layout sheets of the product are studied and the engineering, inspection or production departments are checked on any questionable items. Final results are then compared with master time study data forms and a standard is developed showing the number of hours required to complete 1000 pieces.

The team then presents a developed standard to the time study supervisor. He reviews the study with both men, analyzing and questioning all details, checking the comparisons used on the standard data, reviewing other completed studies, and standard data forms to eliminate any discrepancies.

If there are still unanswered questions, the team returns to the operation and reviews elements that may have been overlooked or that are in question.

When the time standard is approved by the supervisor, it is presented to the industrial engineer for approval or suggested changes. The general manager in charge of operations gives final approval. The standard then becomes a permanent part of the record and is not changed unless there is a change in the method of operation.

The completed time standard is presented to the employee or employees involved, after reviewing it with foreman and grievance man. Every detail is

ELEMENTS OR MOTIONS	1		2		3		4		5		6		7		8		9		10		11		12		13	
	I	R	I	R	I	R	I	R	I	R	I	R	I	R	I	R	I	R	I	R	I	R	I	R	I	R
																					TOTAL		PIECES			
Each cycle contains two elements	#1	03		14		24		35		45		53		53		76		84		92		32				
	#2	11		21		31		42		50		59		72		82		89		97		35		10		
No. 1 Element consists of the																										
following motions:	#1	102		11		20		33		44		53		63		72		81		89		37				
Left foot releases lever	#2	09		17		27		41		49		59		69		77		86		95		61		10		
while left hand loosens grip (at																										
...ach. approx. 1 full	#1	08					25																			

5

Figs. 4 and 5—Obverse and reverse sides, respectively, of time study sheet

Fig. 6—Setting up this packing department required several months' time study

discussed. Copies of the standard, Fig. 2, are sent to the payroll department, to the union, to the grievance man in the department, to the timekeeper and foreman, to the estimating department, and to the general manager for filing in the time standard books. A temporary record is typed on scratch paper for the foreman and payroll department.

Following is a step-by-step procedure of a single operation from the original time study through its completion and installation. The operation, Fig. 3, is full cone pointing one end of $\frac{5}{8}$-inch hanger bolts, vise grip work, performed on an Oliver single spindle 2-inch hand pointer machine. This operation is performed for ease in entering the bolt into chaser dies for thread cutting and to expedite assembly in the field. The operation is similar to sharpening a pencil.

Production performed on this operation before the time study and methods improvements were made was 2690 pieces per 8 hours. After the standard was installed, production was 3952 pieces per 8 hours, an increase of 47 per cent. Employees' earnings were increased approximately 25 per cent.

Reviewing the step-by-step procedure, the request for task or time standard was made by the foreman; the time study team reviewed the job, established the method and proceeded with the time study. During the original study, the team noted the operator was idle during the pointing element No. 2. The time study team suggested to the operator that he perform part of the handling time of element No. 1 during the pointing time of element No. 2. This change reduced the handling of element No. 1 by 50 per cent and the results appeared on the second time study. The operator was receptive to the suggested economy of motion and effected the change immediately on the second time study.

Three hundred and thirty pieces were studied in 36.13 minutes overall time, 1.40 minutes lost time, and the net time was 34.73 minutes. During the course of the time study, the elements listed on the observation sheet, Figs. 4 and 5, were condensed, abbreviated, simplified and enumerated for ease in recording. We use the continuous watch reading method. The watch was not stopped until the time study was completed.

Time is recorded at the break points of each element of a cycle. Each time this motion occurs, a time recording is made. Then at the time study man's desk or on the job if possible, the subtractions are made of these continuous readings to obtain the actual time recording for each element. Actual time readings are transcribed to a selection sheet, recording the frequency distribution of time taken on each element. Module time or the time occurring most frequently is selected from the selection sheet and transferred to the recapitulation sheet, Fig. 7. This recap sheet shows the element number, detailed description of each element, the actual or selected time, the rating of skill and effort, the personal and fatigue allowance, and the number of times it occurred in a cycle. The actual or selected time is then extended to the standard or allowed time per element and per piece.

There are seven elements in the cycle of this operation—two repetitive and five nonrepetitive. These are:

Element No. 1—Raise left foot to release lever. Turn vise handle approximately one turn with left hand to loosen vise grip simultaneously, move next bolt to position in vise with right hand, bumping finished bolt to drop into tote box underneath the machine in the same motion. Turn vise handle approximately one turn with left hand to tighten vise grip, push down lever with left foot, advance bolt to form cutter and guide bolt into cutter with right hand.

Element No. 2—Hold lever down with left foot to cone point the bolt, pick up next bolt from bin at right of operator 12 inches, dip

TS8

RECAP SHEET

SHEET NO. 1 OF 2

DEPT. NO. TC-128	DATE 10-1-45	DESIGN NO. Various
DEPT. Thread Cutting #2	OVERALL TIME 36.13	
OPERATORS NO. 4586	LOST TIME 1.40	DESIGN NAME 5/8"Hanger Bolts
MACHINE NO. 57-2186	NET TIME 34.73	OPERATION NO. 18 4" x 9/16"
TYPE OF MACH. Hand Pointer	NO OF PCS. 330	OBSERVER W. S. Vare
% NOR. EST. 125	% NOR. ACT. 134	DWG. NO.

OPERATION Full cone pointing - one end - 5/8" Hanger Bolts - vise grip work. SAE 1020

SYM.	DETAILED DESCRIPTION	ACT. TIME	RATING %	FATIQUE %	OOO	STANDARD TIME PER ELEMENT	STANDARD TIME PER PIECE
1	Raise left foot to release lever - turn vise handle approximately one turn with left hand to loosen vise grip - simultaneously move [illegible]dition in	.030	125	110	1/1	.0413	.0413

7

Fig. 7—Recapitulation sheet

point end in oil cup 6 inches from cutting head while machine is cutting.

Element No. 3—Pick up bottle of oil at left of machine 5 feet with left hand, return and pour oil into cup near cutting head and replace bottle on shelf at left of machine 5 feet.

Element No. 4—Pick up rake at rear of operator 2 feet, with rake held in both hands, pull bolts down in bin within arm's length of operator and replace rake at rear of operator 2 feet.

Element No. 5—Refill bottle of oil from can approximately 40 feet away, once each day.

Element No. 6—Wait for die-setter to remove cutter, grind to proper form, replace and adjust.

Element No. 7—Get empty tote box with hand truck 30 feet away and return in position under machine, during which time the craneman removes full tote box from beneath machine.

Total of standard or allowed time is 0.1394 minute per piece. This is converted into hours by dividing the total time of 0.1394 minute by 60, which equals 2.3 hours (dropping off the second place decimal to round off for payroll purposes when less than 2 per cent) per thousand pieces as the standard time or 435 pieces per hour task.

This information is given to the typist to prepare a time standard sheet, indicating the method used and all pertinent information, including whether it is a standard for a group or an individual, machine number, type of machine, operation number, date issued, date effective, the operation and detailed description, part number, tools, revolutions per minute, surface feet per minute, feed per revolution, standard task or number of pieces per hour, standard hours allowed per thousand pieces. We also indicate in parentheses the number of pieces per hour required to earn 25 per cent incentive. The job history sheet is also completed.

This is a very short, simple job requiring ½-hour time study and installation within a day. Other operations require weeks, months and in some cases over a year to develop and complete, due to interruptions, delays, changes and corrections. Forging operations, for instance, require development of standard data on heating times. Reviewing several board and steam hammers and furnaces brought to light differences in heating times that needed corrections, suggestions and changes in design of furnaces.

Revised data were reviewed with the engineering department and the engineers who designed the furnaces in question. These studies required the use of an optical pyrometer to determine the correct amount of time the various size bars should remain in the furnace before pulling for forging. The studies required considerable tact and diplomacy to change past practice on part of employees and foreman.

To construct heat curves, it was necessary that a considerable range of products be studied. Due to production scheduling, orders and customer requirements, completion of the curve required considerable more time than would have been required on an experimental basis.

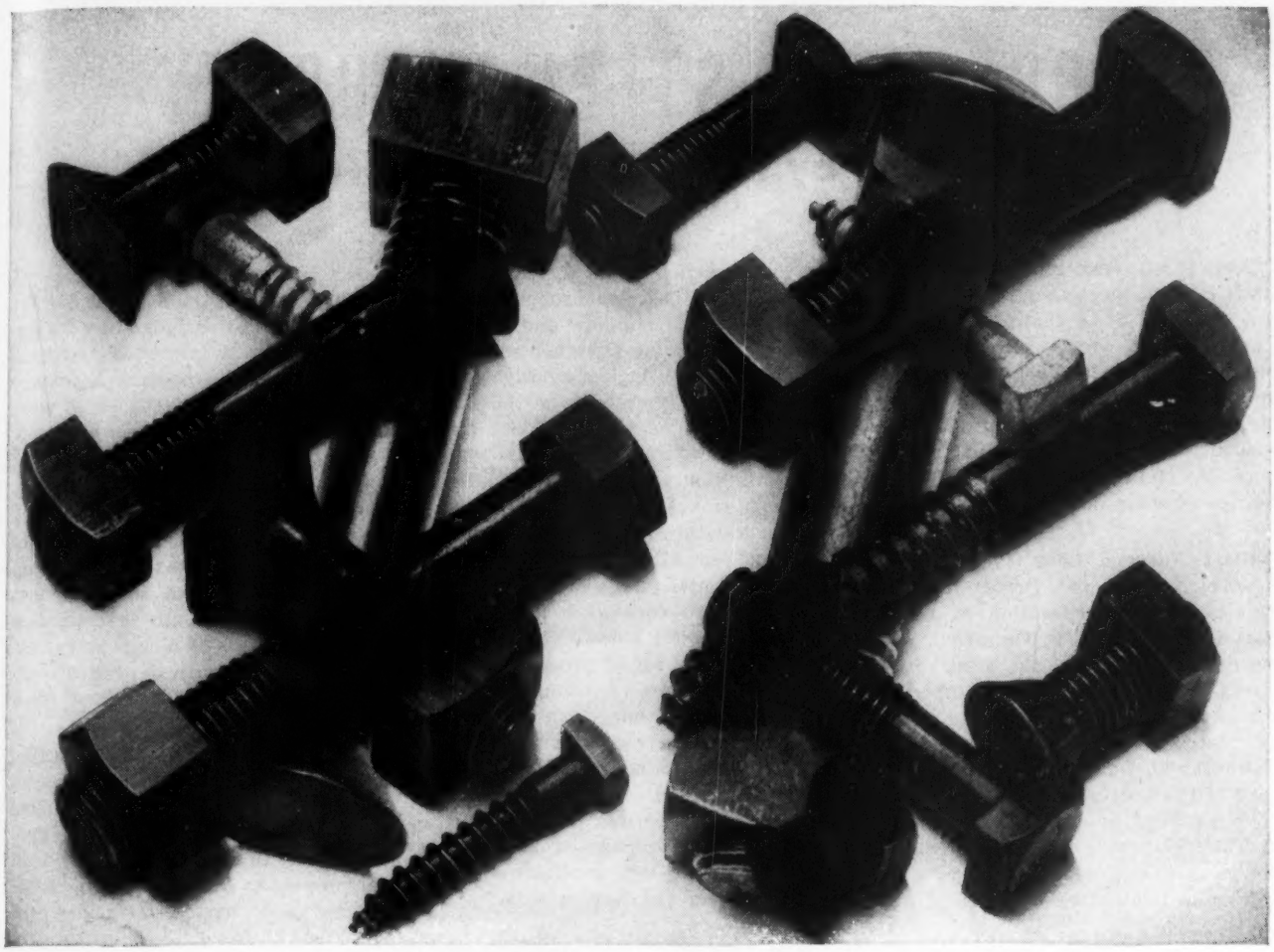
Another example of a time study requiring several months is packing material for shipment in freight cars, Fig. 6. Formerly this had been done by packers moving into various areas where material was in a finished state and packing in boxes, cartons or kegs. In reviewing these time studies with the plant superintendent, he recommended that a uniform arrangement be made for locating fast moving items for packing and shipping. This study resulted in a complete change in plant layout of two departments.

The operation of pickling and liming wire for the manufacture of bolts is now under surveillance. Revisions and changes are still being made. Based on preliminary studies, we anticipate the same production in two shifts formerly requiring three-shift operations. At the completion of this time standard, revision of layout, location of raw materials, new equipment, racks and storage area, methods of procedures, will all have been affected.

These changes will also require the co-operation of scheduling and planning departments, receipt of raw material by rail, and a definite co-ordination from placing of orders through the pickling and liming operations and the initial operation of making bolts and nuts. This time study has taken about six months to date.

Every time study is like an atomic bomb because it starts a chain reaction affecting employees, union, foreman, superintendent, estimating department, payroll department, cost department, sales department, and industrial relations department.

Time standards must be maintained and controlled after installation. Variations are controlled by continual checks and follow-up through biweekly reports of operator performance from accounting department.



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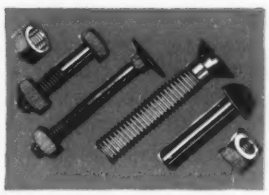

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PROGRESS IN STEEL INDUSTRY

...Marked by Institute Technical Papers

TECHNICAL sessions of the fifty-sixth general meeting of the American Iron and Steel Institute in New York, May 26, were well filled with papers dealing with current progress in coal and coke, oxygen in steelmaking, sources of iron, refractories, specialty steels, coating and finishing. The following are brief summaries of some of the papers:

Blast Furnace Coke Preparation: In their paper on "Proper Sizing, Screening and Preparation of Blast Furnace Coke", D. P. Cromwell, superintendent, Campbell blast furnaces, and C. A. Covington, superintendent, Campbell coke works, both of Youngstown Sheet & Tube Co., Youngstown, O., point out that a history of the uncrushed and uncreened coke as used by Youngstown Sheet & Tube Co. prior to 1929 reveals a story of low production, high coke rates and fluctuating analyses of pig iron.

Coincidental with larger furnaces came coal washing, sintering of ores, better average analyses of all raw materials. These changes all have made for better and higher operating rates that can be attained only by thoroughly sizing and cleaning coke.

Coke must be made strong enough to stand crushing and screening. An occurrence at the plant demonstrated that the size of coke must be maintained to keep furnace production up to par. A crusher at one of the stations broke down and was out of service 48 hours. When the resulting coke reached the hearths of the two furnaces, silicon dropped, the furnaces started slipping and finally scoured off, causing a higher sulphur iron. Due to the higher average size of the coke, the pattern of the gas flow was changed and no doubt the wall condition was upset. As soon as the crusher was repaired and the resulting smaller coke reached the hearths of the furnaces they held their dust, smoothed out and warmed up to a normal analysis.

The authors concluded that their practice has been maintained by rigidly following a set of procedures for sampling, testing, crushing, sizing and cleaning the coke. In addition, standard practice results when variations are kept with 2 per cent of the average adopted for the burdens used. They stated that proper sizing, screening and preparation of blast furnace coke is an absolute necessity to obtain the best results.

Iron Tonnage: Advantages to be gained by using good quality metallurgical coke for blast furnace operation have been recognized by coke plant operators and furnace men since the days when Connellsville coke was the standard. This was brought out by E. J. Gardner, superintendent, blast furnaces and coke plant, Inland Steel Co., East Chicago, Ind., in his paper "Effect of Coke Quality on Blast Furnace Iron Tonnage."

Methods used for judging the suitability of by-product coke for blast furnace operation have undergone considerable development during the last 30 years. In the early days metallurgical coke was judged by its appearance. With improved technical standards, it soon became necessary to develop standard tests which were not affected by the human equation.

During the last few years, the industry has been faced with the problem of finding a suitable substitute for our rapidly depleting supply of No. 3 seam Pocahontas coal. The solution of this problem developed into a plant scale research investigation where selected coal blends were carburized under identical oven operating procedures at the Inland Steel Co.

The author stated in conclusion that definite changes in the coking quality of the low or high volume of coal used in the blend produced a definite change in the physical and chemical properties of the resulting coke. Conventional physical tests, per cent plus 2-inch coke, shatter, tumbler stability and hardness values were shown to be a satisfactory yardstick for measuring differences in the quality of the coke and their resultant influence on blast furnace iron tonnage. More work should be done and data accumulated on carefully controlled coke oven and blast furnace tests, so that we may improve our physical tests and thereby establish a better yardtick to show the effect of coke quality on furnace performance.

Tonnage Oxygen: The following

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conclusions were reached by Julius H. Strassburger, manager, department of service and maintenance, Weirton Steel Co., Weirton, W. Va., in his paper "Tonnage Oxygen for Increased Iron and Steel Production": Use of tonnage oxygen for increased iron and steel production will develop into a new tool for increasing iron and steel production. This utilization will not be confined to any single operation, but for enriching the blast to blast furnaces, to accelerate combustion and decarburization in open hearth furnaces, and for enriching the blast to the bessemer converters as dictated by economic and local conditions.

Work to date has been mostly experimental but with the completion of the large tonnage oxygen plants now under construction the practical experience obtained in the use of this new tool should open up new vistas in iron and steel production.

In summarizing the use of oxygen for enriching the air to a blast furnace, the author found from existing information that with the present design of furnace the amount of enrichment is probably limited from 26 to 28 per cent as a maximum. Preheating of the blast will still be necessary to maintain heat input to the furnace. A moderate saving in coke with an increased iron production of from 10 to 20 per cent will be possible, dependent upon the amount of oxygen enrichment.

Operation of the furnace with oxygen should show lowered flue dust per ton of iron produced with lowered top gas temperatures, lowered top gas volumes, but higher Btu content of the top gas.

Reporting on experiments at Weirton with oxygenated blast on the bessemer converter, Mr. Strassburger used a tabulation which showed a decrease of 25 per cent in blowng time and an increase in production of 37.5 per cent in tons of blown metal produced per minute including a 20 per cent increase in scrap charge. This performance was obtained with only 258 cubic feet of oxygen per ton of blown metal as compared with the German practice of 800 to 850 cubic feet of oxygen per ton where ample oxygen was available for full scale use.

The author cited the following advantages of using oxygen in the open hearth: The majority of the applications of oxygen for accelerating combustion have been confined to liquid fuels such as fuel oil, tar and pitch and have definitely shown that the scrap can be melted in less time. Use of oxygen in this manner made it possible to fire a greater amount of fuel per unit of time and a more intense flame radiation effect is obtained. The amount of fuel that can be burned depends on the amount of oxygen used and the size of the open hearth furnace involved.

Oxygen in the Open Hearth: Chief advantages of direct oxidation are faster heat time and decrease of skull, state Frank G. Norris, statistical metallurgist, and Edward B. Hughes, foreman open hearth metallurgy, both of the Wheeling Steel Corp., Steubenville, O., in their paper "Some Practical Aspects of Direct Oxidation in the Basic Open Hearth Process".

Factors which affect or are affected by the comparative speed of decarburization are: Ton per hour on a charge to tap basis; cubic feet of oxygen used for decarburization; percentage of scrap in the charge; percentage of ore in the charge and carbon content of the bath at start of direct oxidation.

In deciding the best combination of charge ore, iron and scrap, a choice must be made between production in terms of tons per hour and best utilization of feed ore and oxygen in terms of comparative speed. Long time view foresees the use of large amounts of cheap oxygen made on a tonnage scale from an inexhaustible supply. This cheap oxygen can be used to supplant an ever-dwindling supply of open hearth feed ore.

From the standpoint of day-to-day operation the amount of charge ore and the percentage of scrap (and iron) in the charge are beyond the control of the operator. Chief factor within the choice of the operator is carbon content at the start of direct oxidation. Starting direct oxidation at lower carbon (0.30 compared with 0.50 or 0.60) gives better comparative speed and lower cubic feet of oxygen which in itself is associated with better comparative speed. If a heat melts high the best practice for the limited supply of oxygen, as we had during this study, is to work from 0.30 or 0.40 per cent carbon with ore and then begin direct oxidation.

Savings from faster heat time are estimated at $1.25 per minute as the cost of operating an open hearth furnace. The benefits of increased yield are based on $40.00 per ton. This figure is admittedly an estimate which includes several factors other than ingot cost. The price of the oxygen used throughout 1947 was $3.35 per 1000 cubic feet. The average amount for heat is estimated as the total cubic feet of oxygen divided by the number of heats using oxygen and is 7200 cubic feet per heat which makes the cost of oxygen $24.10 per heat.

The author concludes that previous experimental heats demonstrated the faster rate of carbon elimination made possible by using direct oxidation. Benefits of direct oxidation are evaluated in terms of comparative speed, faster heat time and decrease of skulls. One important factor govern-

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cated widely different ideas regarding patching, or perhaps they reveal, in some cases at least, a lack of definite opinion of what the practice should be.

Some open hearth operators insist on maintaining furnace temperature between the heats. This helps to "set" clinkered dolomite, and calcines the raw dolomite. It drains the slag from the banks and bottoms and prepares the way for sintering of a bottom of higher refractoriness. Other operators chill their furnaces by cutting off all fuel between heats for as much as 25 minutes. This allows the slag to solidify in place, prevents setting the clinker, and very little calcination of raw dolomite can take place.

To the ceramic technologist this means that the bottom has not been prepared for the refactory, and the refactory itself will have no preparation for service by the time charging begins. Slag is not a refractory and too often it is allowed to be covered with refractory only to be released at some inopportune time later on.

Oxygen in Electric Furnaces: A great deal has been said and written concerning the use of oxygen. Extravagant claims have been made, and ill-advised experiments have been undertaken which have tended to retard rather than promote the use of oxygen.

According to J. H. Eisaman, superintendent, No. 2 electric furnace, Carnegie-Illinois Steel Corp., Chicago, experience at South Works has proved that the proper application of oxygen is of sufficient advantage to justify its use. Consequently, oxygen has completely replaced ore or scale in electric furnace practice.

In his paper, "Use of Oxygen for Decarburization and Melting in Electric Furnaces", the author said that this change has resulted in a number of advantages. Increased tons per operating hour have been obtained primarily because of rapid carbon elimination. An improvement in alloy steel quality has been obtained. Savings in stainless manufacture are most apparent. In this grade the use of oxygen has permitted larger quantities of stainless scrap to be charged; has contributed to improved chromium recovery from scrap and to shortening of the heat time.

Mechanized Mining: John Griffen, McNally Pittsburg Mfg. Corp., Pittsburgh, in his paper "Modern Mechanized Mining and Coal Preparation for Metallurgical Coal" stated that the mobile loading machine is the dominant unit today in the United States, being responsible for 76 per cent of all bituminous coal mechanically loaded underground and for 35 per cent of all bituminous coal produced.

Use of mobile loading machines materially increases output per man-day and reduces mining costs, but tends to affect adversely quality mine output, increasing the refuse content and the variability of impurities and other qualities.

In the districts of the Pittsburgh seam in Western Pennsylvania producing coking coals, the use of modern coal-washing and blending facilities offers assurance of correcting the adverse effects of mechanical loading on coal quality at a substantial saving in cost per ton of coal delivered to the ovens and of coking coal cost per ton of pig iron.

Hot Work Steels: Although there has been a sizable tonnage of high alloy hot work steels produced for many years, there is not much available in the literature on the physical metallurgy of these steels, particularly on the metallography of these steels and on their mechanical properties at elevated temperatures. Peter Payson, assistant director of research, and A. E. Nehrenberg, assistant supervisor, laboratory, Crucible Steel Co. of America, Harrison, N. J., presented their paper, "Metallography and Properties of High Alloy Hot Work Steels" in the expectation that a more intimate understanding of the microstructures and properties of these steels might lead to the development of better steels, or to better application.

Steels of higher alloy content which are used for gripping and upsetting tools in forging machines; for hot piercing tools; extrusion tools for copper, brass, and other nonferrous alloys; and die casting tools for zinc, magnesium, aluminum, and brass, were discussed. In most of these applications, the steel at the working surfaces is nearly always at temperatures over 1000° F, and in brass die-casting service it may attain temperatures as high as 1550° F.

More recently, newly developed steels of approximately 5 per cent chromium with about 0.35 per cent carbon, and small amounts of silicon, vanadium, tungsten, and molybdenum, have been found to be satisfactory for many applications in which toughness is of more importance than abrasion resistance. There are still more than 20 different compositions in use today for different hot work applications, but of these, probably the most important from a tonnage viewpoint are the two chromium, and two tungsten steels.

These steels have residual carbides as conventionally treated, but the tungsten steels contain more carbides than the chromium steels, and the 12W2Cr steel has more than the 9W3Cr steel. The 5Cr-Mo-V steel is somewhat more resistant to grain coarsening than the 5Cr-W-Mo steel. All of these steels, although generally considered to be air hardening for large sections, are subject to the precipitation of carbides at grain bound-

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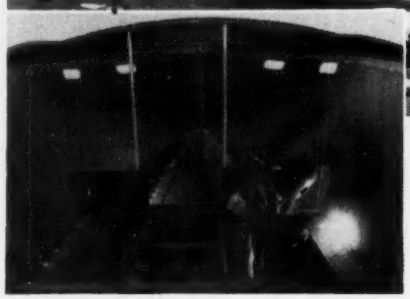

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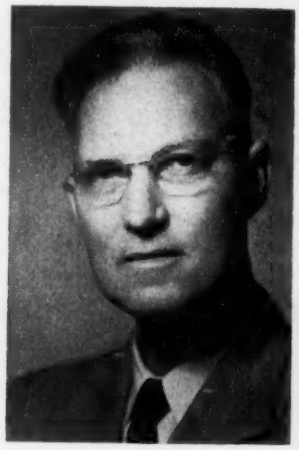

E. D. MARTIN

aries, and to the formation of bainite or intermediate product during the commercial heat treatment of sections 4 x 4 x 4 inches.

Tungsten steels are much more resistant than the chromium steels to softening during long exposures at temperatures above 1000° F. The chromium steels on the other hand are much more resistant to notch impact, particularly at the lower testing temperatures. The chormium steels are also more ductile, as measured in the elevated temperature tensile test. Hot hardness and tensile properties are about the same for all steels and depend on the room temperature hardness of the steels as heat treated. The thermal expansion properties are about the same for all steels, but the tungsten steels have slightly better conductivity than the chromium steels.

Continuous Coating: Advantages obtained through developments in continuous rolling, bright annealing in coils, and strip temper rolling, have permitted consideration of the continuous coating operation. This observation was made in the paper entitled "Continuous Coating" by F. M. Morrow, superintendent of galvanizing, and K. Oganowski, associate director, research, Armco Steel Corp., Middletown, O.

The authors discussed the processes involved in coating lighter gage flat rolled steels where the product is coated in either coil or sheet form by the hot dip method, and sold to fabricators in this form. In general, once a continuous line is installed, and the more or less serious starting difficulties are overcome, there is never a return to individual sheet coating operation. Furthermore, these installations reach into realms of quality and rates of production in various types of metallic coatings that are unobtainable in sheet units.

It is only reasonable to expect that the conversion of the entire industry to continuous coating is only a matter of time, for sheet coating lines are now facing exactly the same fate as was faced by the sheet rolling hand mills of a few years ago.

Strip Pickling: Edwin D. Martin, research metallurgist, Inland Steel Co., Chicago, in speaking on "Continuous Strip Pickling" mentioned that the technical problems involved in continuous strip pickling of mild, plain carbon steel may be divided into four groups: Mechanical and electrical equipment for continuously pickling strip steel in the form of coils or of a continuous strip; developments of a scale which pickles readily; conditions of acid pickling bath, prepickling preparation and rinsing to yield good pickling at high speed; disposal of waste pickle liquor to the best economic advantage while avoiding stream pollution and lake pollution.

At present there are three methods of pickling hot rolled coils. Two of these are considered to be continuous in nature while the third is semicontinuous. The latter type in addition to the Greer rotary coil type are adapted to the requirements of smaller producers of strip, where the tonnages are not great. When the tonnages of hot mill coils pickled become large, the continuous strip pickler is the conventional type that is used.

G. C. KIEFER

Speed of pickling may be defined as the maximum line speed, allowable for clean pickling. It depends upon the characteristics of the scale, and on pickling conditions. At the present time, this speed is less than the maximum mechanical speed, which ranged from 100 to 300 feet per minute. Since pickling rate depends upon the activity of the pickling bath and upon the nature of the scale, these two factors have received considerable attention.

In conclusion the author stated that from experience gained over the years the modern continuous strip pickling lines were developed in an interesting series of individual improvements which had to be tested in the cauldron of practical application. While mechanical and electrical developments proceeded to high attainments, the knowledge of conditions under which the scale could be made to pickle faster lagged far behind.

Only recently has sufficient attention been devoted to the conditions under which a fast pickling scale can be formed and to the composition and temperature changes in sulphuric acid baths which will yield high pickling speed. High speed pickling baths have been developed in which the rate of pickling is substantially independent of iron sulphate content, and of a practical and economically sound process for the regeneration of spent pickling solutions for re-use instead

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of dumping them as waste pickle liquor.

High Temperature Metals: Important high temperature metals developed so far for jet engines and gas turbines have structures that are austenitic in character. The structures contain precipitated compounds, presumably representing carbides and nitrides of the metals chromium, molybdenum, tungsten, columbium and titanium. These compounds are distributed at random throughout the structures, particularly if the alloys are heated in the range from 1200-1500° F.

In his paper entitled "On the Structure of the High Temperature Metals", Russell Franks, chief metallurgist, technical service and development department, Electro Metallurgical Co., Pittsburgh, noted that presence of these compounds lowers high temperature ductility and increases high temperature strength. These effects are most marked in metals with large grains. The grain size effect is not so marked on hot toughness which appears to be aided by the presence of the precipitated compounds. This is considered an important contribution of the compounds.

Indications are that if the manner in which these compounds are precipitated can be controlled with a simultaneous control of grain size, a structure can be produced that will be very stable and retain its mechanical properties at high temperatures. It is suggested that the problem of developing a ferritic alloy suitable for use under the high temperatures met with in the operation of the jet engines and gas turbines might possibly be solved by proper control of the grain size of the alloy and the nature and distribution of a precipitate which has proved so successful in the case of the austenitic alloys.

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structures of metallic bodies have an important influence on the mechanical and physical properties. Ample proof of the influence of structure is shown by the many publications on the structures of the comparatively simple carbon and low alloy steels. All of the constituents in the structures of these simple steels have not been fully identified, and it can be said that the problem of identifying the constituents in the highly complicated high temperature metals is more difficult. Nevertheless, familiarity with the present available information on the structure of these high temperature metals should be of great value to those interested in their production and use.

Metals discussed by the author include both the wrought and cast products, and have been classified for the sake of simplicity into three groups. The classification contains primarily alloys developed in this country. First group represents iron base alloys, the second, nickel base alloys (except Inconel X), and the third, colbalt base alloys.

Effect of Composition on Stainless Steels: Low carbon chromium nickel stainless steels in the fully annealed condition, are no more resistant to corrosion than are steels of similar composition but of higher carbon content. George C. Kiefer and Claude M. Sheridan, associate directors of research, Allegheny Ludlum Steel Corp., Brackenridge, Pa., in their paper "Effect of Composition on Low Carbon Austenitic Chromium - Nickel Stainless Steels" reported that neither carbon, nickel nor nitrogen influenced the corrosion rates in boiling nitric acid, or the resistance to sulphuric acid, salt spray or pitting.

C. M. SHERIDAN

Chromium, however, improved resistance to nitric acid but did not affect the resistance to sulphuric acid, salt spray or pitting.

These findings were confirmed by other investigators. It would appear that very little improvement in resistance to general corrosion can be expected by variations in composition of the low carbon 18-8 steels in the fully annealed condition.

As would be expected, low carbon 18-8 shows superior resistance to intergranular corrosion than the normal 18-8 steels containing in the neighborhood of 0.06 per cent carbon. However, where changes in the corrosion resistance after short periods of exposure (100 hours) in the sensitizing temperature range are considered, the effect of carbon and nitrogen is determined by the chromium content. When the chromium is approximately 17.5 per cent, the carbon content must be kept well below 0.03 per cent, along with low nitrogen.

With increasing chromium up to 20.5 per cent, the influence of carbon and nitrogen becomes less pronounced and with 19.5 and 20.5 per cent chromium, carbon up to 0.037 per cent, or nitrogen up to 0.25 per cent did not

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severely impair the corrosion resistance after sensitizing for 100 hours at 1000 and 1200° F. Nickel did not appear to influence the corrosion rates, but this is not certain as few heats containing high nickel and low nitrogen were tested. It is indicated, therefore, that in low carbon chromium nickel steel more consistent behaviors, along with lower corrosion rates, will be obtained after sensitizing by controlling chromium rather than carbon.

Where substantial immunity to intergranular attack after long periods in the sensitizing range is concerned, the effect of composition parallels that of the short time tests, with the exception of nickel. While the data are not complete there is sufficient evidence to confirm the conclusions of Rosenberg and Darr that a high chromium nickel ratio is beneficial.

Mechanical properties of the low carbon steels is affected by variations in chromium, nickel and/or nitrogen to about the same degree as the higher carbon chromium nickel steels. Tensile properties appear to be a function of the carbon plus nitrogen content. Only one chromium-nickel range (19 per cent chromium, 8 per cent nickel) was investigated for impact strength. At room temperature, neither carbon nor nitrogen materially affected the results. At subzero temperature (—320° F), high carbon and/or nitrogen lowered the impact strength, whether fully annealed or sensitized at 1200° F.

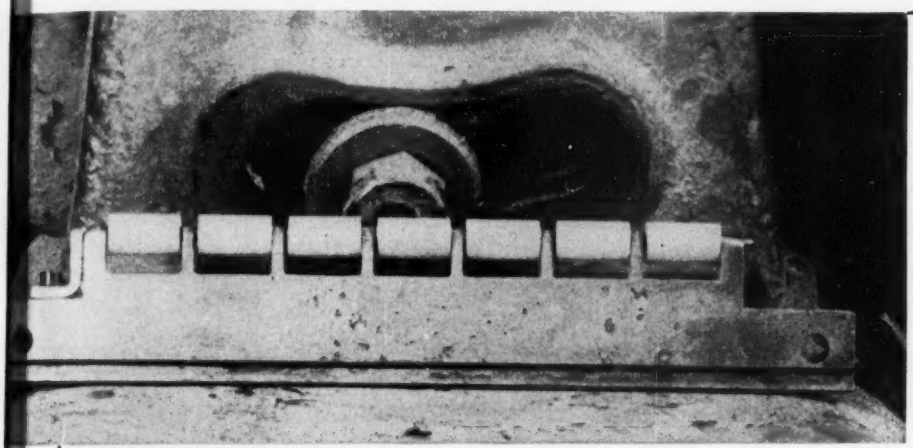


Fig. 1 (Below)—Aluminum tubing going through centerless grinder equipped with roller rest made of nylon rod. To minimize wear on rollers, tubing is passed through machine in each direction alternately by shifts

Fig. 2 (Left)—Quick, easy replacement of rollers when necessary, once per week, is made possible by the method of fastening shaft to plate with one Holochrome screw passing through an angle welded to the shaft

CENTERLESS

Grinding Problems

. . . solved by using nylon rollers

DIFFICULTIES in centerless grinding of aluminum tubing with belt machinery at Warren MacArthur Corp., Bantam, Conn., were alleviated by installing nylon rods made by Polymer Corp., Reading, Pa., to serve as roller rests during grinding operations, Fig. 1. Sheet fiber rests used in the past had a tendency to pick up particles, wear fast and consequently mar stock being ground. Since this stock is subsequently anodized, surface scratches were greatly magnified.

Fiber rollers were first tried out, but they picked up water from bath used in grinding, swelled and, instead of rotating, they bound on shaft giving same results as fiber sheets. Nylon rollers proved successful and are operating currently for a week before any replacement is necessary. The week consists of two daily shifts for 6 days, and during this time approximately 30,000 feet of 1-inch outside diameter aluminum tubing are ground satisfactorily with as much as 0.015-inch being removed.

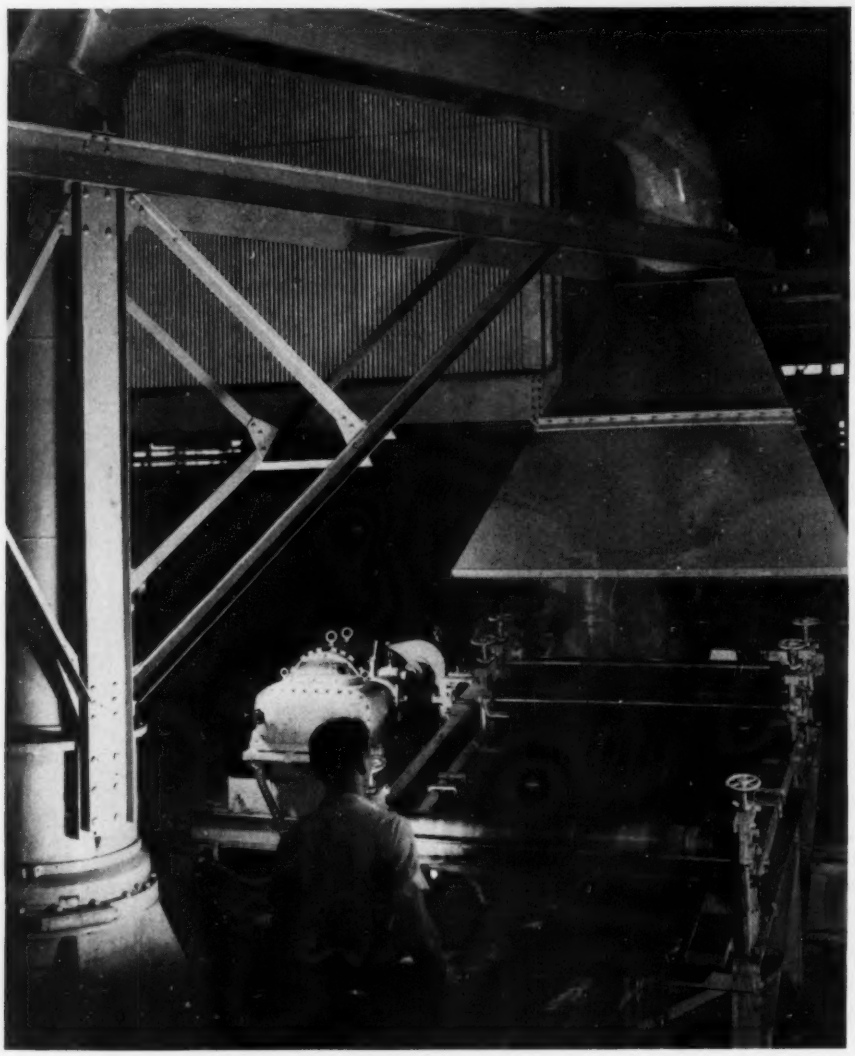
Sizes of tubing being ground range from ½ to 3½ inches in diameter with tubes 1-inch diameter being the predominant size. For this reason larger diameter nylon rollers are not used although they would probably be better for grinding the larger diameter tubes. Rate of speed of tubing through the grinder is 20 feet per minute with the stock revolving at about 1500 revolutions per minute.

During wet grinding the high revolution rate of the stock is not too important since a constant stream of cold water keeps temperatures down. Tests of performance of nylon rolls in dry grinding where considerable heat is generated are under way at plant of Production Machine Co., Greenfield, Mass.

PROGRESS OF FLUXING IN

Hot Galvanizing Practice

Wetting agents reduce surface tension in making up flux washes and create stable foams when flux is in fusion on molten zinc. Iron content of flux wash should be kept under 0.3-ounce per gallon. Separation of work minimizes staining action



By A. T. BALDWIN
Chemical Engineer
Hanson-Van Winkle-Munning Co.
Matawan, N. J.

REPLACING the muriatic acid flux wash with water solution of zinc ammonium chloride found wide acceptance a decade ago in all fields except among sheet galvanizers where some of the inherent characteristics of such a flux wash presented serious obstacles to its use, even though these same characteristics were contributing to its success in other fields. Eventually, this change was made successfully.

The present day concept of the importance of cleanliness of the surface of strip steel that has followed these developments should increase the interest in the performance of a flux wash as a protecting agent to keep clean surfaces clean. While a flux must have cleansing ability, this feature should be called on less than its ability to protect the cleaned surface from contamination.

The zinc ammonium chloride corresponding to the formula $ZnCl_2$-$3NH_4Cl$, has remained unchanged during these years. Much has been learned about the things that can be done with this compound itself and its water solutions. The melting point is recorded as 644 degrees Fahr., and only as this temperature is approached does the familiar white sal ammoniac fume appear. Dissolving the salt in water does not alter this characteristic, so that the flux films formed by the flux wash require time to bring them to a state of fusion. Time to reach the necessary state of fusion is seldom obtained by delaying the progress of the work through the zinc kettle. Rather, the path through the flux fusion at the entrance to the kettle is lengthened or

TABLE I
CONCENTRATION OF ZINC AMMONIUM CHLORIDE FLUX WASH

Degrees Baume	Lbs. flux per gal. at 68° F.	$_pH$
6	0.51	4.76
8	0.89	4.56
10	1.20	4.41
12	1.53	4.28
14	1.90	4.17
16	2.24	4.09
18	2.60	4.03

TABLE II
SURFACE TENSION

Material	Du Nouy values, dynes
Zinc ammonium chloride	60.3
No. 20 flux	50.2
+0.10% wetting agent	34.6
+0.05% wetting agent	36.8
+0.01% wetting agent	36.4

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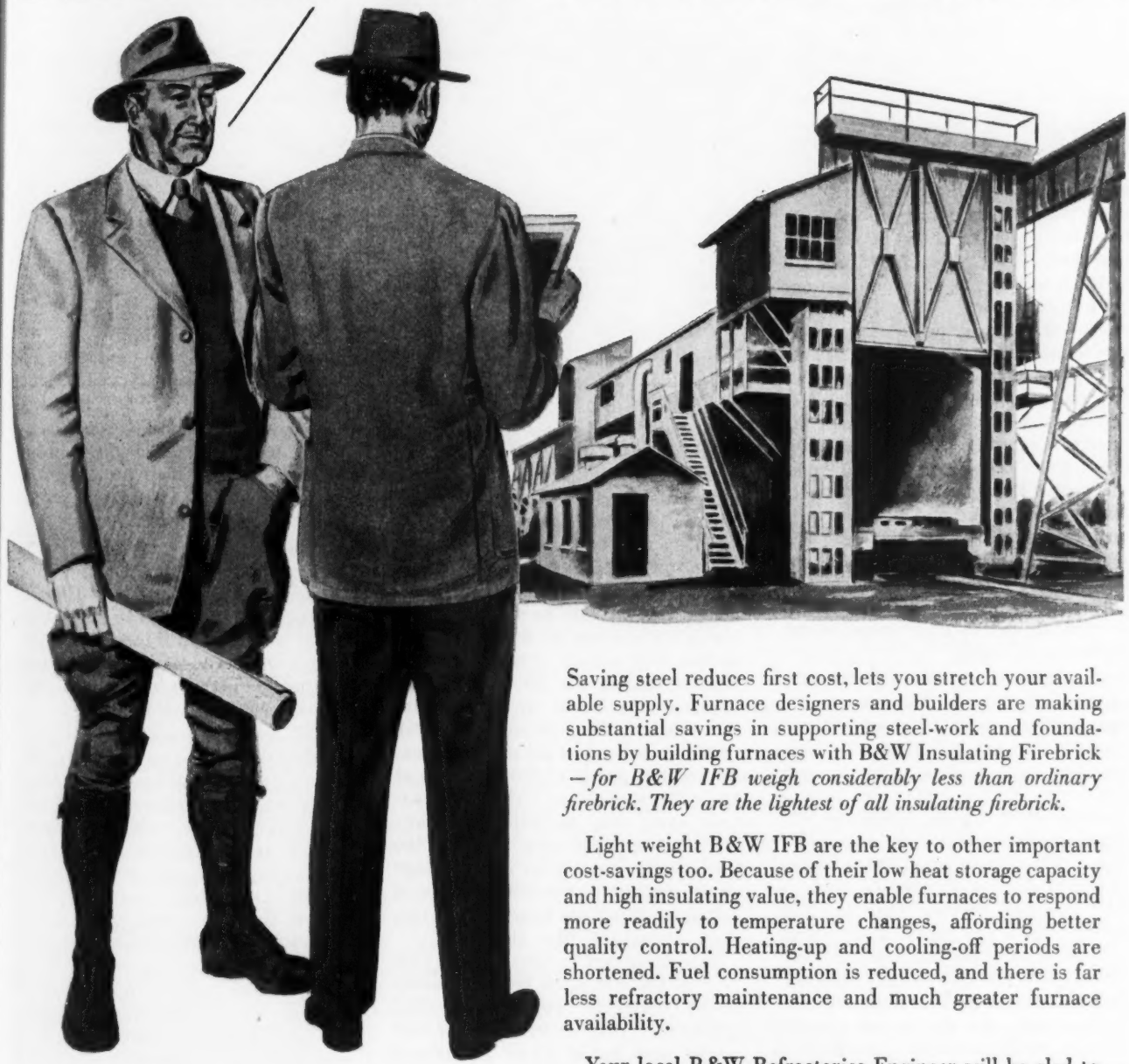

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there is recourse to preheating in a reducing atmosphere. Such studies have led to a final shortening of the total time through the zinc kettle for many products, including continuous processes for wire and strip.

A sort of zinc ammonium chloride flux wash is prepared by some galvanizers by leaching the sal or flux skimmings in water. Generally, various amounts of sal ammoniac are dissolved in these extracts, and these final solutions, reading from 15 to 40 degrees Baume, are used as thus made. A characteristic of all the samples of these solutions that we have been able to check is the fact that before extra sal ammoniac is added, the zinc chloride and ammonium chloride are present in a 1:1 molecular ratio, since the zinc chloride is present in the ratio of 73 parts to 27 parts of sal ammoniac by weight. Reference to literature will find descriptions of this 1:1 ratio salt as having a melting point of 449.6 degrees Fahr. Such a material lacks merit as a flux wash, due both to its low melting point and because it is an inert end product of fluxing. The added sal ammoniac is not stable under heat in this solution and is lost substantially as rapidly as if added as crystals to the flux fusion on the molten zinc.

Concentrations, etc., of the zinc ammonium chloride flux wash in the range most useful to sheet galvanizers, is presented in Table I. Temperature correction is approximately 0.039 per degree Fahr., so that a reading of 12 degrees Baume at 170 degrees Fahr. indicates an actual flux solids content of (170-68) multiplication symbol x 0.039 + 12.0 or 16.2 degrees Baume, that is, 2.24 pounds solids per gallon are present.

Since area of the sheet or strip and lineal speed are factors that influence the amount of flux carried forward by the work, the decision on concentration and operating temperature will be made with these conditions in mind, namely, the higher the speed, the lower the concentration with initial, exploratory runs to be made in the 10 to 12-degree Baume range.

Temperature adjustments call for more careful study, and increases should be made cautiously. If there is an adequately deep fusion in the flux box so that the flux film is brought up to fusion before, or as, it reaches the molten zinc, low flux wash temperatures (100 degrees Fahr. or lower) are preferable. At higher speeds this may not be practical, so that some heating may be required in the flux wash to save time in creating the fusion in the flux box. Great care must be taken

TABLE III
TESTS ON 15 DEGREE BAUME SOLUTIONS

A—Stability When Heated

Iron present at start, gms/liter		Iron after 24 hr. at 150/160° F., gms/liter		Change in iron content, gms/liter		pH of filtrate
Fe++	Fe, total	Fe++	Fe, total	Fe++	Fe, total	
6.87	7.01	6.66	6.84	—.21	—.17	2.60
2.42	2.60	2.32	2.62	—.10	+.02	3.25
.85	1.00	0.952	1.07	+.10	+.07	3.68
.53	.67	0.595	0.714	+.06	+.04	3.70

X-Fe here determined in filtered samples. The stock 15 degrees Baume flux wash reads 3.7 pH.

B—Relation of pH to Purification

pH at start	Iron at start, gms/liter		% H_2O_2 by volume added	Iron after adding H_2O_2 and filtering, gms/liter	
	Fe++	Fe, total		Fe++	Fe, total
2.56	7.40	7.45	2	1.09	7.07
4.36	7.40	7.45	2	0.29	7.07
5.44	7.40	7.45	2	0.18	2.37
5.79	7.40	7.45	2	0.14	0.59

C—Effect of Iron-Zinc Ammonium Chloride-Iron Cell

Solutions allowed to stand with no additions (Concentrations in gms/liter)				Solutions with the Fe/$ZnCl_2 3NH_4Cl$/Fe cell (Concentrations in gms/liter)			
Elapsed hours	pH	Fe++	Total Fe	Elapsed hours	pH	Fe++	Total Fe
0	4.08	2.03	2.03	0	4.06	2.03	2.03
96	3.76	2.12	2.12	96	3.93	2.30	2.33
192	3.61	2.12	2.15	192	4.01	2.48	2.51
528	3.29	2.15	2.12	528	4.21	2.84	2.88

to prevent small pores from appearing in the dried flux film. The almost invisible oxidation that will occur in such pores will lead to flux spotting and, in extreme cases, to uncoated areas.

No. 20 Flux contains wetting agents that reduce surface tension in making up flux washes, as well as create stable foams when the flux is in fusion on the molten zinc. The major constituent of the No. 20 Flux is zinc ammonium chloride, so that the information in Table II may be useful.

Tests were made on solutions containing 350 grams of flux per liter at 75 to 77 degrees Fahr. The other wetting agent may be either DuPont's No. 189S or Santomerse No. 1, or the like, and is present as a percentage of the weight of the No. 20 Flux in solution. Their use may permit further control of film thickness.

It is important to keep the iron content of the flux wash low, preferably under 0.3-ounce per gallon (2.25 grams per liter). Values over 0.5-ounce per gallon (3.75 grams per liter) will prove troublesome in so far as flux spotting is concerned. This is not difficult or expensive to do. Hydrogen Ion (pH) values are given in Table I for the No. 20 Flux. If free acid is being carried into the flux wash, the pH will soon read below 3 and the rinsing should be investigated for thoroughness. If the pH values remain at the level of those shown or are somewhat higher, then such iron as is actually dissolved in the flux wash can be removed by adding ammonia and hydrogen peroxide. At a pH of 5.4 or higher, over 90 per cent of such dissolved iron will be precipitated by this treatment. Also, at the pH values shown in Table I, a high iron content sludge will form slowly which can be removed by simple means. This sludge removal is generally sufficient to keep the iron content of the flux wash within the desired operating limits.

It is considered that any iron in solution in the zinc ammonium chloride flux wash is in the ferrous state, so studies of its stability have been made. A standard solution of chemically pure $FeCl_2.4H_2O$ was prepared and used in the experimental flux washes made from No. 20 Flux.

The same stock solutions as in Table III-A were used in the test shown in Table III-B. The pH was obtained by adding hydrochloric acid or ammonia as required. All pH measurements are electrometric. A similar test, adding ammonia only and allowing the test solution with a pH of 5.82 to stand at room temperature for 96 hours, showed no appreciable change in the ferrous iron or total iron content. An oxidizing agent must be used to purify the solution.

Tests shown in Table III-C were made at room temperature, and merely standing undisturbed does not affect the iron present. The beakers containing the pairs of polished steel sheets to form the cell, however, soon developed a light brown sludge—the same sludge seen in galvanizing shops. Note that the iron in solution still is ferrous. This same electrolytic attack is the cause of the brown stain that forms at points of contact of pieces that have not cooled quickly when they were withdrawn from a flux wash. Separating the work as much as is practicable keeps this staining at a minimum.

Zinc ammonium chloride flux wash can be used to perform three useful functions, namely:—

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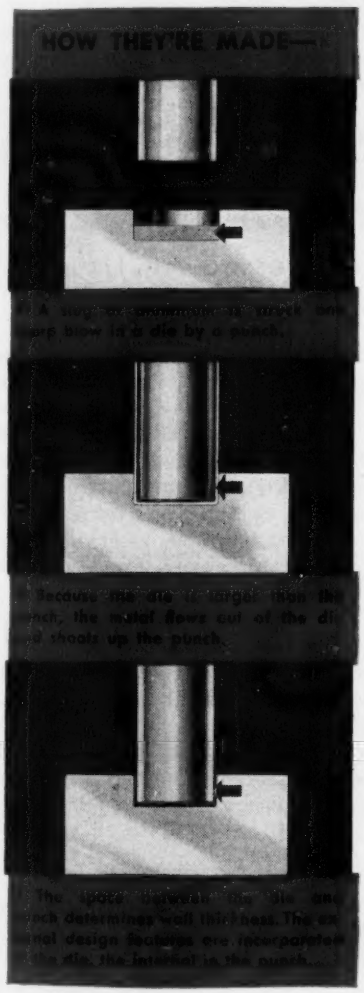

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cleansing as the work enters the molten zinc.

2. To retard oxidation of the work that has been cleaned.

3. To serve as a control point from which to check the thoroughness of the preceding preparatory operations.

The most practical method of preventing the dragging of free pickle acid into the flux wash is to use two running cold water rinses in tandem.

Repeated tests have shown that under such a condition, any SO_4 present in the flux wash is in proportion with the iron present to form $FeSO_4$. Extensive sampling and analyses of the things involved over a period of 10 weeks in a plant galvanizing an average of 1100 tons of pipe per week, disclosed that the iron entering the zinc kettle as a constituent of the flux wash was 5.6 per cent of the amount of iron present in the dross removed during the period under observation.

Mention has been made of the high melting point (644 degrees Fahr.) of zinc ammonium chloride and the apparent "slowness" of such a kettle flux. The slowness is more apparent than real with reference to the speed of galvanizing as expressed in weight per hour of galvanized work. An important point is to have the molten zinc covered with a highly fluid layer at least 1/8-inch thick, acting as a bed for the foam. The hard gravel which settles in this layer should be removed at intervals so that free flowing will be a constant condition. Under these conditions, rate of travel through the flux fusion is determined by height of the flux, the weight of metal to be heated, and the amount of new flux to be brought to a fusion on the metal. These are all factors to be considered in adopting a density of the flux wash that supports the flux fusion. Zinc ammonium chloride fluxes with froth producers incorporated in them have found favor because they are stable as fusions and simplify the creation of the desired operating conditions.

A development in fluxes started along with the need for lead-tin alloy coatings of low tin content. Fluxes of fixed melting points that are fluid at all times can be made by using mixtures of alkali and metallic chlorides. As described for use in lead alloy coating by the National Lead Co., they are called nonaqueous fluxes apparently because they are used in a fused state only. Water solutions as flux washes are not used, although wet objects can be placed in the fused flux. Moving into the galvanizing field, the use of a preflux step is being tried in the form of a fusion of the mixed chloride material in a separate metallic container. Since these fusions are strongly erosive, an operating problem exists. Preheating of the work to the temperature of the galvanizing kettle is claimed to be advantageous.

Progress of fluxing in hot galvanizing has been pointed out as progress in the use of fluxing agents. One new type of flux and process is in its infancy today. Real progress has been in a fuller understanding of the importance of thoroughness and care in each of the steps taken in preparation of the work for the actual hot-dipping. Experience with zinc ammonium chloride type fluxes opens the door for sheet galvanizers to use these controls in solving their operating problems. These data also apply in other fields of galvanizing.

From a paper presented at the twentieth meeting of the Galvanizers Committee, St Louis, April 15.

Organic Finishes

(*Concluded from Page* 59)

process was drastically reduced. In addition, spray application of the phosphating solution made possible the coating of large objects such as refrigerator cabinets and automobile bodies which do not lend themselves readily to immersion coating. Phosphate coatings produced by spray application have a fine-grain crystalline structure and are especially suitable as a base for organic finishing operations.

To expedite the phosphate coating formation further and make possible the coating of sheets and strip steel at the mills, application of the solution containing an oxidizing agent was modified[14] in 1940 to include the use of rotating rolls and brushes to initiate the coating reaction and further reduce the time of coating to 3 to 10 seconds. This method extended the field of phosphating by providing a coating which in addition to inhibiting corrosion and increasing the adhesion of applied paint finishes would withstand drawing, bending, and other mechanical deformation encountered in the manufacture of caps, crowns and cans.

Such phosphate coated steel also permits painting in the flat and formation of articles therefrom, with the advantage of good paint adhesion and corrosion resistance. Fig. 14 shows a comparison of the crystalline structure of the phosphate coating (Bonderite), as applied to fabricated articles, with the phosphate coating which will withstand forming as applied to sheets or strips.

To withstand the most severe forming operations, without injury to the phosphate coating, it was found necessary to limit the amount of coating on steel to not over 100 milligrams per square foot of surface. For less severe forming, such as bending and embossing, coating weights in excess of this amount have proved satisfactory. There has been installed in most major steel mills, since 1940 equipment for producing sheet and strip steel suitable for painting in the flat and the forming of articles therefrom with the assurance of good paint adhesion and improved corrosion resistance.

(*To be continued*)

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—o—

Results of tests of reinforced concrete columns are contained in a bulletin recently published by Engineering Experiment Station, University of Illinois, Urbana, Ill. Major features studied are: Effect of combined bending and direct compression, effect of column slenderness and manner of failure, and effect of protective shells as structural elements. More than 500 columns were tested over a period of years to study the foregoing and related topics.

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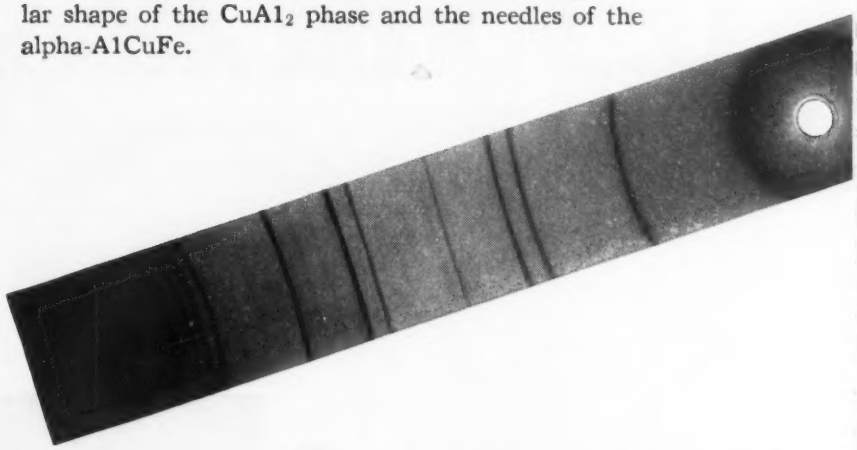

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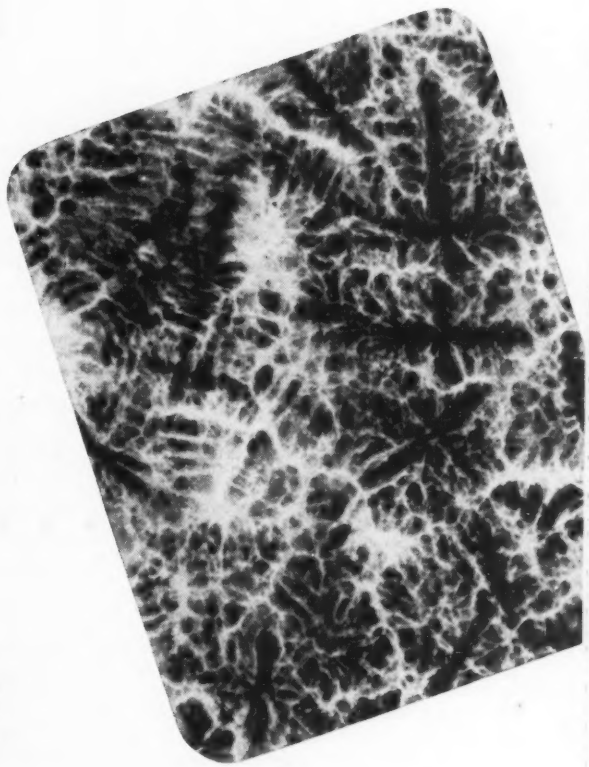
2. X-Ray diffraction to determine the relative position of atoms in metals . . . With x-rays and a diffraction camera, this technic produced the above record to identify the components of the same aluminum alloy and measure their proportions. It can show the factors influencing fatigue, strength, or thermal behavior in a material.

3. Microradiography to show composition in depth rather than on a single plane . . . With fine grain emulsions, low-voltage x-rays, and microscope, this technic produced this 35X-magnified x-ray study of the same aluminum alloy. It can show the factors influencing pressure tightness, by depicting how evenly the phases are distributed and indicating whether voids are present.



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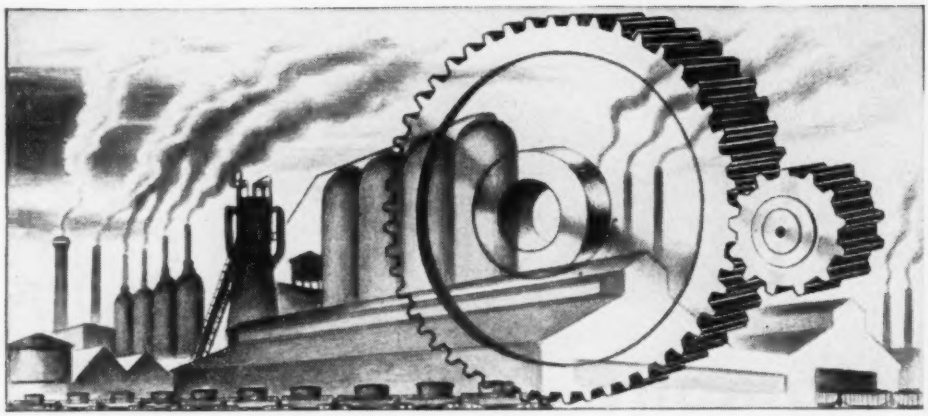
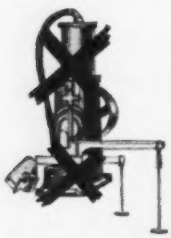


For many years it has been customary to use the Timken test machine to determine the breakdown point of lubrication. Recently a large steel plant decided that this was not a sufficient test to determine the safety point and went a step further as described in the text of this advertisement.

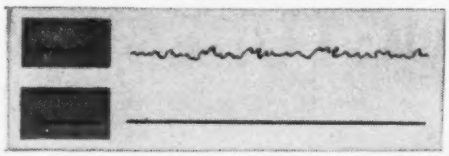
Normally the hardened and ground steel block and cup shown at the left is under constant lubrication during the Timken test and is fairly indicative of true operating conditions for bearings. However, this is not true for the lubrication of open gears. In the latter instance the applications are always of intermittent nature with the result that the application or film applied has to serve a rather long period of time before renewal is made.

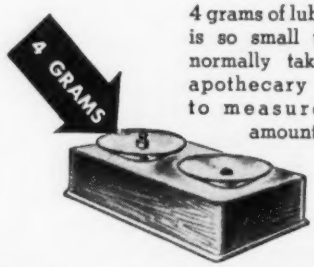
This condition also exists with sleeve bearings where applications were intermittent, the bearings usually being of babbitt, bronze and cast iron.



To accomplish this condition on the Timken testing machine, the pump or flow of oil was shut off and an application of 4 grams of lubricant placed on a cup and block.

The machine was then set in operation and was watched closely until the block began to show signs of scoring as illustrated in the top line of the chart. So long as a project line appeared as is shown in the lower half of the chart, the lubricant was performing satisfactorily. In conducting this test no unusual methods were used . . . 4 grams of the lubricant under test were applied to the exterior surface of the block and cup—at room temperature. To our knowledge and to the steel company who made this original test, it is the only method that is a satisfactory answer to the lubrication of open gears in service—a lubricant that will stay on the gears and lubricate for the greatest length of time without failure.





4 grams of lubricant is so small that it normally takes an apothecary scale to measure the amount.

At the right we show the actual laboratory results of the comparative 4 gram test with competitive products.

The lubricants tested in comparison to Klingfast are all considered of quality nature and are used for open gear lubrication in general industry but particularly so in the severe service of steel plants.

Because open gears are lubricated periodically and not constantly, the pH-ilm must have lasting or enduring characteristics. Thus, the 4 gram test is truly representative of actual field operation tests for open gears. This enduring action together with extremely high pH-ilm strength guarantee the machine actual lubrication and protection.

We will gladly send you a generous sample on request.

RESULTS OF 4 GRAM *Klingfast* LEADOLENE TEST

30 MINUTES
without scoring or failing.

LUBRICANT "A"

5 MINUTES
A high grade compound scored at 5 minutes and failed in 12 minutes.

LUBRICANT "B"

8 MINUTES
A reputable lubricant of residual nature scored and failed in 8 minutes.

LUBRICANT "C"

6 MINUTES
A good lead compounded extreme pressure grease lubricant for open gears and general grease lubricant scored and failed in 6 minutes.

LUBRICANT "D"

6 MINUTES
A well-known lead compounded pressure grease lubricant for open gears and pressure lubricating systems scored and failed in 6 minutes.

*LEADOLENE—the "I. P. Lubricant" (Indestructible pH-ilm) . . . for industrial needs.

The Brooks Oil Co.

Pittsburgh 19, Pennsylvania
Cleveland, Ohio
Hamilton, Ontario
Warehouses: In Principal Industrial Cities

New Products and Equipment

Lift Truck Ladle

Three tons of molten metal directly from the fixed mixing ladle at the cupola may be handled by the rotating transfer ladle mounted on a lift truck, designed by Yale & Towne Mfg. Co., Philadelphia, Pa. Entire operation of following the ladle lift

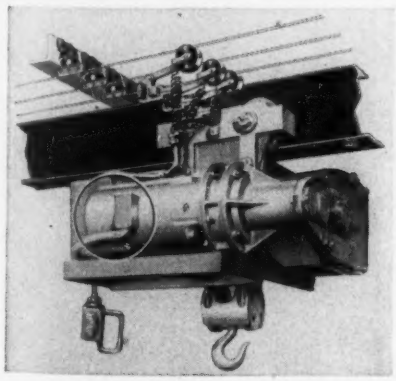
up and down as pouring proceeds, transporting loads to pouring ladles and pouring the metal is performed by one operator who controls all movements from one position.

Basic truck (illustrated) is an electric powered 8000-pound high-lift platform type with six steering wheels for even load distribution. Refractory brick lined ladle is permanently mounted on a heavy fabricated skid engaged by the truck platform and pinned to it. Ladle rotation is hand controlled from driving position.

Check No. 1 on Reply Card for more Details

Electric Hoists

Incorporated in the design of all pushbutton type electric hoists, built by Robbins & Myers Inc., Springfield 99, O., in capacities from 250 to 10,000 pounds, is an automatic self-



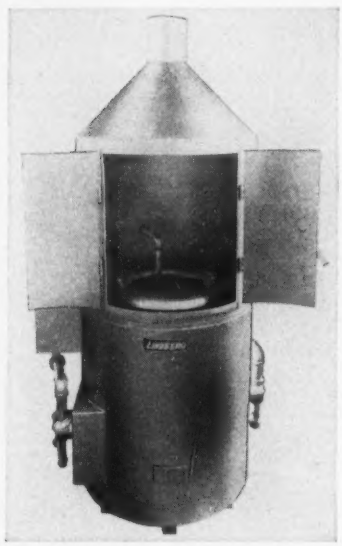
equalizing motor brake. Magnetically released, it consists of a series of self-aligning circular friction disks, alternated with brake plates attached to the motor shaft. The mechanism is operated automatically by dual-voltage brake coils that correspond to those of the hoist motor.

Adjustment is by an external screw. Advantages claimed for the brake are larger friction areas, freedom from "drift", longer life, uniform wear, smoother braking and minimum maintenance.

Check No. 2 on Reply Card for more Details

Cyanide Pot Furnace

Hi-Life gas-fired furnaces with guaranteed-life cyanide pots are announced by Lindberg Engineering Co., 2444 West Hubbard St., Chicago 12, Ill. Faster heating and greater efficiency are claimed for these furnaces,



some of which are in operation after 8000 to 15,000 hours.

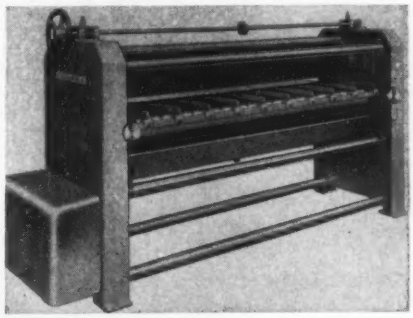
Use with cyanide or lead (neutral salts excluded) under automatic temperature control is covered by the guarantee. Furnace is offered in four standard sizes using pots 24 x 21, 20 x 21, 16 x 18 and 12 x 18 inches.

Check No. 3 on Reply Card for more Details

Roll Coating Machine

Flat material may be coated with drawing compound, oil, wax, paint, etc., by the roll coating machine developed by Columbia Machinery & Engineering Corp., Hamilton, O. Machine features 10-inch coating rolls and 8-inch doctor rolls, the latter turning at a much slower speed than the coating roll, thereby producing a wiping action that contributes to evenness of spread. Spread depth is maintained by handwheel adjustment.

Standard coating rolls have a corrugated rubber surface with circumferential grooves, 0.025-inch deep, spaces 20 to the inch. Rolls are driven through a chain and sprocket drive and geared-head motor. Standard drive speed is 75 lineal feet per minute, but use of variable speed drives will give other speeds. Rolls, tables and troughs are easily removed for cleaning. Machines are made in four

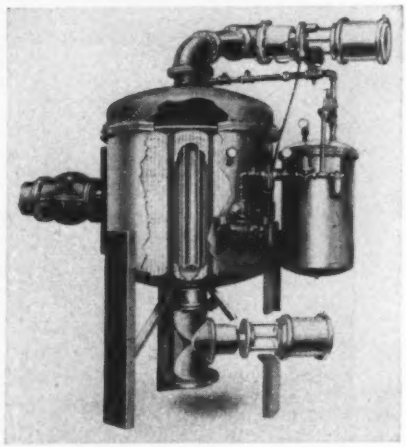


roll arrangements for coating one or both sides and in roll sizes from 32 to 104 inches, in 6-inch increments. Material up to 4 inches thick may be handled.

Check No. 4 on Reply Card for more Details

Coolant Clarifier

Increased tool life, better finishes with fewer rejects, elimination of hand labor to clean machine tool sumps and lines, and better control of dermatitis are accomplishments of the automatic clarifier, developed by Honan-Crane Corp., 636 Wabash Ave., Lebanon, Ind., for continuous clean coolant supplying. Coolant is filtered under pressure through screens of

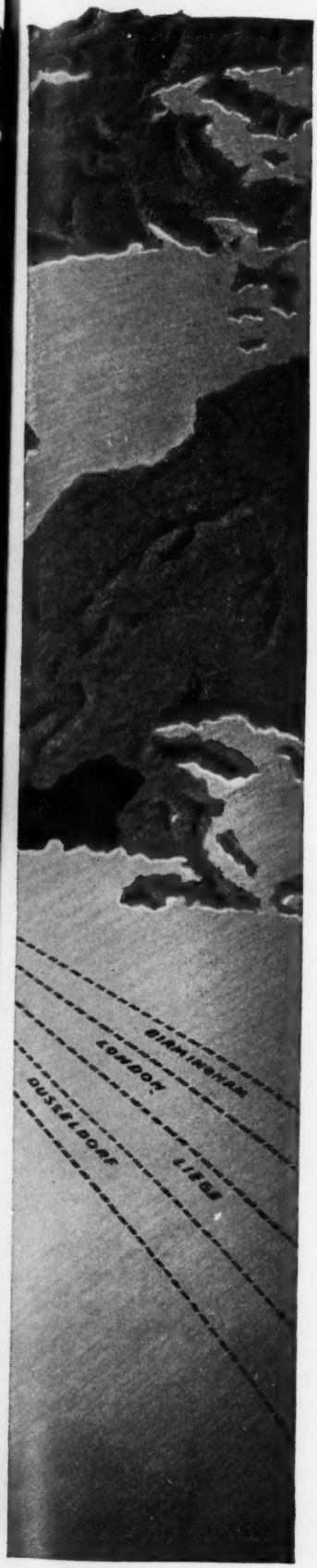


250 and 496 mesh. A coating of particles builds up on screen surface, forming a porous coating which becomes a filtering medium itself.

Abrasives are permitted to build up on the screen for a predetermined time. At the end of this period an electric timer actuates a blow-down mechanism — clean coolant forced back against the filtering screens

Wherever metalworking

news is made



STEEL'S EDITORS ARE ON THE SCENE
TO REPORT DIRECTLY TO YOU

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ABC ABP

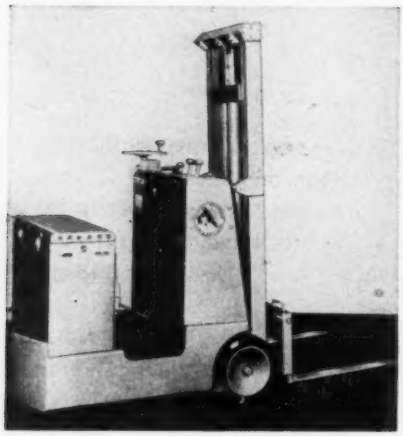
You are well-informed about this growing industry when you "look for it in STEEL" every week.

and out of clarifier. Seven sizes are offered, from a single tube model with a flow rate of 5 to 15 gallons per minute to one with 37 tubes and a flow rate of 1000 to 1200 gallons per minute.

Check No. 5 on Reply Card for more Details

Electric Fork Truck

Available in both telescopic and nontelescopic models, the Standrive 1000-pound capacity electric fork truck, made by Lewis-Shepard Products Inc., 278 Walnut St, Watertown



72, Mass., is designed to carry full 48-inch long loads of maximum capacity. Stability and safety of operation are insured through full 34-inch width and proper weight distribution.

Telescopic model with collapsed height of 83 inches gives 130-inch lifting height. Pivot point steering permits operation in confined areas. Brakes are of the "deadman" type. Use of sealed ball bearings and self-lubricating bronze bushings minimizes maintenance. There are only five lubrication points, all readily accessible. Truck is operated from standing position for maximum visibility and ease of operation in either direction.

Check No. 6 on Reply Card for more Details

Steel Belt Conveyor

Sermat Conveyor Corp., 2350 West 58th St., Chicago 36, Ill., is manufacturing the Flex-E-Unit steel belt conveyor which, by the addition of any number of 4 or 5-foot sections to the two basic units builds a completely integral conveyor up to 175 feet long. Of the two basic units, the head section contains the drive assembly and the opposite end is the takeup section, each 5 feet long.

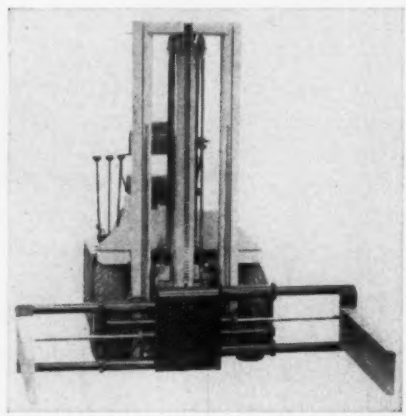
Speed is 30 feet per minute, but other speeds and variable drives are available. Conveyor may be mounted without legs 9 inches off the floor, or with adjustable legs, its height may be varied from 27 to 33 inches. It can be tilted for assembly work and jigs and fixtures can be mounted on the moving table. Side boards can be made as an integral part of the side panel or added when necessary. Drives are from ½-horsepower up. A wide range of temperatures may be handled.

Check No. 7 on Reply Card for more Details

Box, Bale Handler

The Load-Grab, offered for use with the 20 and 40 model lift trucks made by Hyster Co., Portland 8, Ore., will squeeze-grip bales, cartons, boxes, barrels or drums with equal facility. Model 20 will handle up to 1780 pounds and model 40 up to 3350 pounds.

Steel arms are operated and hydraulic controlled by a lever at the driver's right. They spread from a



minimum 17 inches to a maximum of 62 inches on model 20 and 66 inches on the 40. Arms can be lowered within 6 inches of the floor, or with an adapter plate, to the floor. Various special types of arms are available.

Check No. 8 on Reply Card for more Details

Diesel Electric Plants

Powered by a 1 cylinder, 4-cycle air cooled diesel engine, the model 205DSP 2500 watt electric power plant, one of two new lines introduced by D. W. Onan & Sons Inc., 43 Royalston North, Minneapolis, Minn., is available with alternating current voltages of 115 or 230, single-phase or 115/230 volts, single-phase, three-wire or 230 volts, three-phase, three wire. Accessories include 6-volt starting batteries in series, muffler, an extra fuel injection pump, battery hydrometer and remote start-stop station.

Other line offered by the company is water cooled diesel electric plants of 10,000 to 30,000 watt capacities, powered by Buda diesel engines and enclosed in weather-proof housings. Two 6-volt starting batteries and a 12-volt, belt-driven generator for recharging are supplied. Features include close current regulation, circuit breaker, low oil pressure and over temperature cutoff switches. Models available are in 50 and 60-cycle, single and three-phase current of all standard voltages. Direct current models of 10 and 15 kilowatts are available in either 115 or 230 volts.

Check No. 9 on Reply Card for more Details

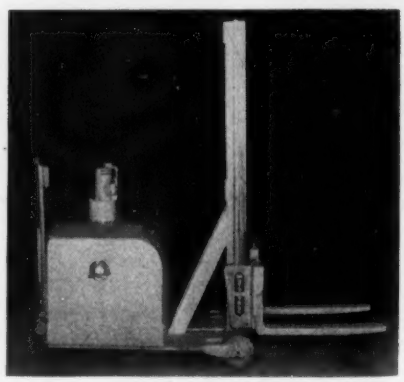
Floor-to-Floor Conveyor

Of slider-bed type construction with nosed-over delivery and power-driven tail feeder, the floor-to-floor conveyors built by Sage Equipment Co., 30 Essex St., Buffalo 13, N. Y., are available with 8 to 24 inch wide, 3-ply, 28 ounce duck rough top rubber-coated belts. Unit is furnished with gear head motor and a 25-foot rubber covered cord. It is factory assembled, installation taking approximately 1 to 2 hours.

Check No. 10 on Reply Card for more Details

Motorized Hand Truck

Shorter overall length for operation in narrow aisles, shorter turning radius and light weight are features of the 2500 pound capacity 12-volt Hi-Lift counterbalance motorized



hand operated Walkie truck, made by Moto-Truck Co., 1953 East 59th St., Cleveland, O. It is built in three types: 66-inch nontilting; 66-inch tilting mast; and 80-inch telescopic with tilting mast. First two models have an 83-inch overall height, while the latter is 96 inches.

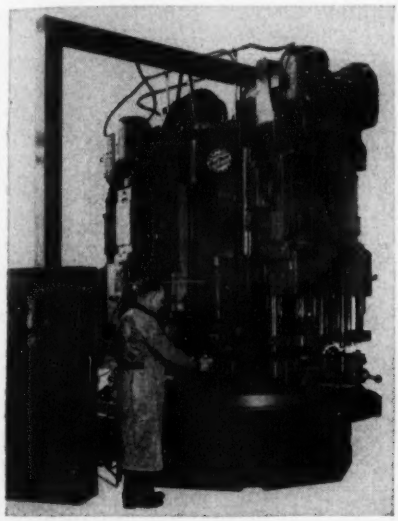
Adjustable fork spread is 32 inches and length of forks is 30 inches. Control handle is of natural grip roller design, giving two speeds forward and two reverse by a twist of the wrist. A pushbutton operates the

lifting and lowering of the forks. Buttons operate an electric motor and hydraulic pump. Spring return handle contacts safety switch and applies brake to drive wheel when in vertical position. Power is furnished by two 6-volt, 495 amperes hour batteries.

Check No. 11 on Reply Card for more Details

8-Station Machine

Mounted on a ball bearing race, the work table of the model VSI 8-station indexing type machine, made by Davis & Thompson Co., 6411 West Burnam St., Milwaukee 14, Wis., has an



external micro adjustment for table clearance. Work circle of machine is 80 inches and table diameter is 88 inches. Adaptable to a wide range of metalworking operations, the illustrated machine drills, reams and chamfers a 1.281-inch hole and saws a slot in both ends of front suspension spindle support arms.

Indexing of table is accomplished hydraulically through fluid motor and worm and worm wheel. Drill heads are individually counter balanced units, hydraulically operated for rapid advance, feed and rapid return. The electrical system provides complete operator control for both manual and automatic cycling.

Check No. 12 on Reply Card for more Details

Temperature Controller

Instrument Division of Thomas A. Edison Inc., West Orange, N. J., is producing a simple, fast and precise temperature controller which uses a single electronic tube with an electrical resistance type bulb for thermal pickup. Use of the resistance bulb permits location of the sensing element at a point remote from the control panel. Nonindicating devices are available to cover the temperature range from minus 100°F to plus 1200° F and adjustable within a range of several hundred degrees.

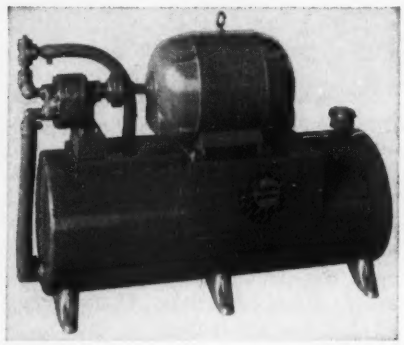
Supply voltage may be 115 or 230 volts, 50-60 cycle alternating current. Load capacity is 30 amperes at 115 volts, 20 amperes at 230 volts. Accuracy of the controller is independent of usual voltage variation. Normal time response is under 3 seconds.

Check No. 13 on Reply Card for more Details

Hydraulic Power Units

Known as the Cubline, a new series of packaged hydraulic power units, developed by Hydro-Power Division of Hydraulic Press Mfg. Co., Mount Gilead, O., may be applied to forming, bending, straightening, pressing, lifting, pulling, lowering, etc.

Units are comparatively small in size, requiring but little mounting space. Three capacities of 6, 10 and 15 gallons per minute are offered. Each power unit consists of a 35 gallon round oil storage reservoir



with foot mountings, electric motor, 100 pounds per square inch gear pump, relief valve, coupling, pipe and fittings and suction hose and clamps.

Check No. 14 on Reply Card for more Details

Predetermined Counter

Multiple sequence predetermined electronic counters, manufactured by Potter Instrument Co. Inc., 136 Roosevelt Ave., Flushing, N. Y., can be supplied to predetermine any number of selected counts occurring in sequence. At the completion of each of the selected counts a separate relay action is provided for each control function. Counters are designed for counting speeds up to 15,000 per minute.

Only one set of counter decades is used for all of the selected predetermined counts. This is accomplished by presetting into decades the complement of the desired predetermined count. Desired counts can be selected by additional rows of dial switches. For systems which require a large number of different predetermined counts occurring in sequence, the dial switches can be eliminated and a punched tape used for presetting the counter at the end of each count.

Check No. 15 on Reply Card for more Details

Double End Truck

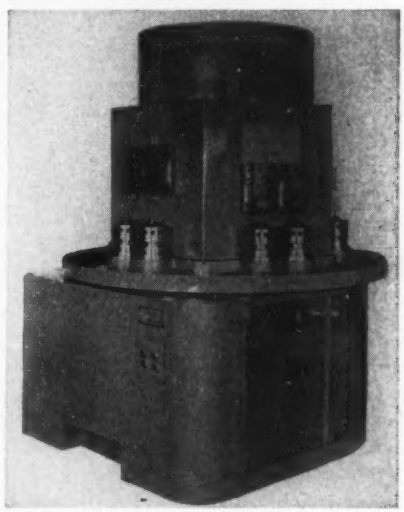
Designed for general utility use in warehouses and shops, a new general purpose double end truck, made by Palmer-Shile Co., 16025 Fullerton Ave., Detroit 27, Mich., measures 52 inches long and 27 inches wide. It is built of seasoned hardwood and is completely metal bound.

The truck's steel end racks, with push handles, are 36 inches from the floor. Each unit has four 6 x 2-inch caster wheels, two swivel and two rigid. There is a choice of rubber metal wheels.

Check No. 16 on Reply Card for more Details

Boring Machine

The model 10-5 high production precision boring machine, designed by Hoern & Dilts Inc., 925 Rust Ave., Saginaw, Mich., is a five-station, 10-spindle machine using Carboloy solid



cemented carbide boring bars for each work spindle. Standard carbide boring bits are inserted in each carbide boring bar. Head of the machine is pentagonal, each side carrying two boring bars. In operation the head and work table revolve continuously. Work spindles stop turning at the loading station, the boring bars also retracting.

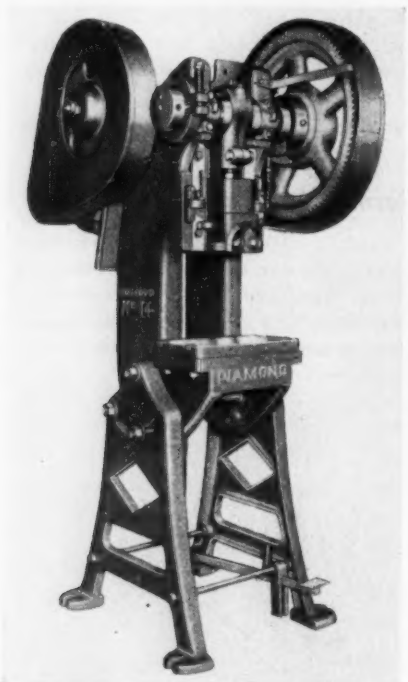
Wear resisting inserts of Carboloy are also used on the cams to insure continuous accuracy. Machine and its cemented carbide boring bars are able to bore parts of greater lengths-to-diameter ratios with greater accuracy. Spindle and work table

speeds are changed by means of interchangeable V-belt pulleys in the drive from the main 10 horsepower 1800 revolutions per minute spindle drive and the 2 horsepower table drive motors. Work capacity is 6 inches maximum outside diameter and ¼-inch minimum inside diameter. Maximum boring depth is 5 inches.

Check No. 17 on Reply Card for more Details

Small Punch Press

Diamond Machine Tool Co., 3429 East Olympic Blvd., Los Angeles 23, Calif., is producing a 14-ton open-back inclinable back geared punch press, capable of 65 two-inch maxi-



mum strokes per minute. It is recommended for use on operations with extra long strokes, with drawing dies, forming dies and in blanking operations where a large amount of shear is required, or with dial feeds.

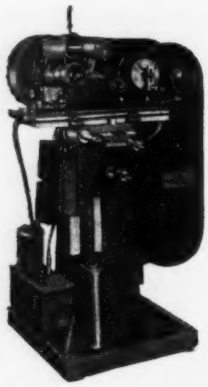
Bed area of the press is 8 x 15 inches and shut die height is 7 inches (model 14-A) and 9 inches (model 14-B). They have a nonrepeat single trip mechanism. Press frames were designed with assistance of strain gage analysis.

Check No. 18 on Reply Card for more Details

Hand Miller

Equipped with a tapered roller bearing spindle, the speeds of which vary from 160 to 1460 revolutions per minute, the No. 1 hand miller, designed by United States Machine Tool Co., 16 East 72nd St., Cincinnati 16, O., may be used for milling boring and drilling operations. It has a vertical feed range of 15¾-inches on the knee and a vertical feed range of 4 inches on the spindle head.

Vertical feed of head allows machine to make high production runs



on keyways, cut-off and similar milling operations. Machine may be equipped with special arbors, plain or swivel vises, vertical milling attachment and dividing head.

Check No. 19 on Reply Card for more Details

Shim Stock Punch

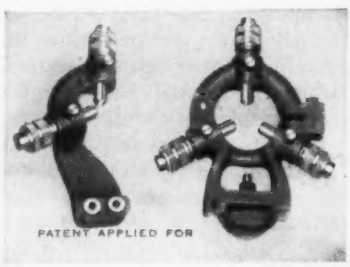
Accurate alignment of centerlines over the material to be punched is possible with the clear plastic topped shim stock punch, made by M & M Co., 426 North Third St., Saginaw, Mich. Made to cut steel or brass shim stock from 0.002 to 0.025-inch thick, the punch can be used to cut various other materials. Overall size is 1¼ x 3 x 3½-inches.

Standard hole sizes of ⅛, $\frac{3}{16}$, ¼, $\frac{5}{16}$, ⅜, $\frac{7}{16}$, ½, ⅝ and ¾-inch are provided. Special sizes may be built. Base is of hardened steel.

Check No. 20 on Reply Card for more Details

Work Supports

Quicker and more efficient operation on certain classes of lathe work is provided by the wrenchless adjustment and locking de luxe follower



rest and center rest developed by South Bend Lathe Works, 390 East Madison St., South Bend 22, Ind. A large knurled knob adjusts the jaw position and a thumb screw locks it in position.

Jaws are made of brass and slide through steel sleeves pressed into the supporting frame. Manufactured to close tolerances, the jaws and other parts are easily replaceable. Both are available for current South Bend lathe models.

Check No. 21 on Reply Card for more Details

Collet Chuck

Chucking operations on South Bend, Logan, Atlas and similar types of lathes may be speeded by the new quick-acting collet chuck developed by Goodwin Mfg. Co., 10 East Broadway, Cuyahoga Falls 20, O. Using a multiple leverage principle and the

cantilever action of hardened steel fingers, it provides a vise-like grip on the material. The small control lever requires only finger tip pressure for actuation.

Threaded nose cap can be removed easily to facilitate collet change or can be turned to adjust collet gripping pressure. Pressure setting is key-locked. Chuck capacity permits use of bar stock up to full diameter of spindle bore, although short pieces of greater diameter can be handled. They are made in two models: The 1-inch capacity chuck fits lathes having 1½-inch eight-threaded nose spindle; the 2-inch capacity models fit any lathe spindle up to 3-3/8 inches.

Check No. 22 on Reply Card for more Details

Bearings

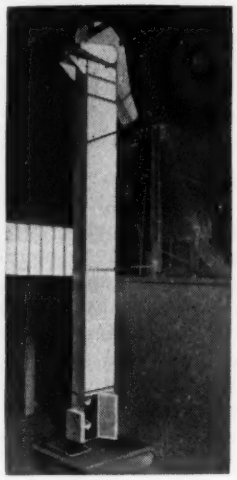
Savings in space and weight without sacrifice of load bearing strength are features of the XLS series of bearings, made by Federal Bearings Co. Inc., Poughkeepsie, N. Y. With interrupted deep groove races, they are capable of taking substantial thrust load in either direction, as well as heavy radial loads.

Series is produced in sizes from 1⅜ to 10-inch bores with outside diameters from 2 9/16 to 13¼-inches. Bearings are fabricated from SAE 52100 steel with close controls maintained throughout the hardening, quenching and drawing cycle. Retainers are made from high quality steel and are of the riveted type.

Check No. 23 on Reply Card for more Details

Bucket Elevator

Equipped with welded steel buckets spaced on 16-inch centers on a rubber elevator belt, the L-Vator, built by Bosworth Mfg. Co., 6723 Denison Ave., Cleveland 2, O., is a 10 x 6-inch vertical centrifugal discharge type



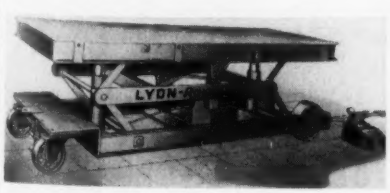
elevator. It can be furnished, by addition of intermediate sections, to operate at a height of 45 feet. Average handling capacity is about 25 tons per hour.

Floating boot section acts as an automatic take-up control, keeping belt taut at all times. Ten-inch diameter pulleys are used. Unit is powered by an electric motor.

Check No. 24 on Reply Card for more Details

Sheet Feeding Table

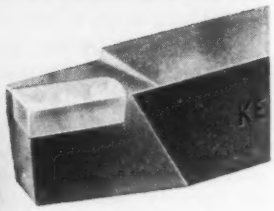
Two vertical hydraulic cylinders which are synchronized by a toggle lever arrangement are incorporated



in the improved standard 10,000 pound capacity portable hydraulic sheet feeding table, built by Lyon-Raymond Corp., 5602 Madison St., Greene, N. Y. Faster and more con-

Typical KENNAMETAL TOOLS

WAYS TO SAVE by using KENNAMETAL TOOLING to Increase Output of Metal Cutting Machines



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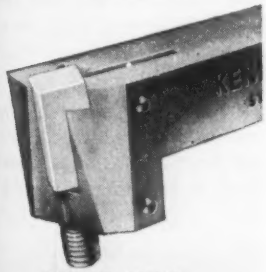

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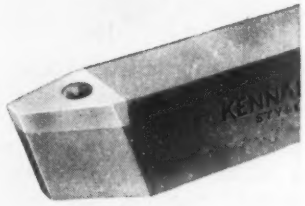
STYLE 11H



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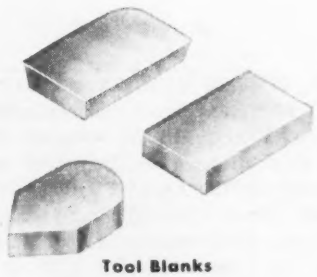

Tool Blanks
Hundreds of sizes
in all popular grades

Your machines are only as efficient as the cutting tools you use. It's good, sound judgment to invest a few extra pennies in long-lived Kennametal tools that can turn out up to five times as much as high speed steel tools on the same machine in the same time. Here's what you can gain by using Kennametal tools:

—**MACHINE TOUGHER, HARDER METALS**
Steel-cutting Kennametal tools cut steels in the hardened state; often eliminate need for annealing and rehardening.

—**INCREASE CUTTING SPEEDS UP TO 1000%**
Kennametal lets you convert electric power into cuttings or chips in the least possible time.

—**REDUCE MACHINE DOWN TIME**
Kennametal cuts within tolerance from 5 to 20 times longer; reduces machine down time required to change tools.

—**LOWER TOOL COSTS**
Durable Kennametal is the lowest-priced tool material when cost is measured in pieces per grind and pieces per tool.

—**MINIMIZE GRINDING**
Kennametal wears longer; requires fewer trips to grinding room for sharpening. New mechanically-held tools simplify procedure—no steel to grind.

Kennametal is made in various steel-cutting grades, each containing $WTiC_2$—the distinctive ingredient that prevents excessive cratering which destroys ordinary tools; and in two cast-iron cutting grades—K6 for heavier, roughing cuts, and K8 for fine finishing and boring.

Ask our field representative to suggest the best Kennametal tooling—the right grade, the right tool—for each of your jobs.

KENNAMETAL Inc.
Latrobe, Pa.

Manufacturers of Superior Cemented Carbides and Cutting Tools That Increase Production

stant elevating speed and easier operation are other improvements. Table top remains level at all times, even under off-center loads.

Platform measures 36 x 96 inches and elevates from a low of 22 inches to a high of 34 inches. A floor lock and towing eye are provided. The hydraulic pump is a two-speed model. Two 8-inch diameter Timken bearing swivel casters and two 12-inch diameter ball bearing wheels support the unit. Optional extras include table extensions, foot pump or motor-driven pump.

Check No. 25 on Reply Card for more Details

Skid Dump

Easily operated, the model MF-1 skid dump, made by Phillips Mine & Mill Supply Co., 2227 Jane St., Pittsburgh 3, Pa., may be used for hauling

and dumping of scrap, sand, stamped parts, etc. Used on fork or platform lift trucks, it has a level full capacity of 24.1 cubic feet, or with surcharge of 30.25 cubic feet. Legs are of formed channels, undercarriage is welded and hopper is of 3/16-inch steel plate.

Check No. 26 on Reply Card for more Details

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DC POWER SUPPLY: Continuously variable direct current voltage from 1000 to 10,000 volts at current drains up to 5 milliamperes is provided by the type IPS10000 10 kilovolt iso-volt power supply, made by Rowe Engineering Corp., Chicago 39, Ill. Regulation of 1/10 of 1 per cent is obtained electronically. Operation is from 105-130 volt, 60 cycle alternating current.

Check No. 27 on Reply Card for more Details

MAGNETIC CHUCK: Angular setups on operations such as inspection, grinding, boring, etc. are possible with the Magni-Sine permanent magnet chuck, manufactured by Robbins Engineering Co., Detroit 3, Mich. Angles are set up by sine bar method using standard gage blocks. Single angle and single and compound angle models are offered in two sizes with controlled magnetic power.

Check No. 28 on Reply Card for more Details

SOLDERED COUPLING: Brockway Co., Naugatuck, Conn., is manufacturing Uniflex bronze seamless flexible metal hose with this new coupling, for use where temperatures less than 300°F are involved. Hose and couplings may be customer cut and assembled. Hose is offered in 25 foot lengths and couplings come with soldering tools.

Check No. 29 on Reply Card for more Details

DIAL HOLDING RODS: Brown & Sharpe Mfg. Co., Providence 1, R. I., is offering dial holding rods with fine adjustments. Dial test indicator Nos. 730, 733, 744 and 744A are accommodated by one of the two models and Nos. 731 and 731A by the other. Gage point contacts the work and pointer hand swings to desired position on the dial.

Check No. 30 on Reply Card for more Details

CARBON DIOXIDE NOZZLE: An L-type multijet nozzle for smothering dip tank and drainboard flammable liquid fires with carbon dioxide gas is announced by Walter Kidde & Co., New York 16, N. Y. It is designed for mounting close to tank side and to spread a fan-shaped blanket of gas.

Check No. 31 on Reply Card for more Details

ROTARY JOINT: Heating or cooling agents may be admitted to rotating rolls by the self-supporting type S rotary pressure joint developed by Johnson Corp., Three Rivers, Mich. Unit is self-lubricating. A bearing of carbon graphite supports the entire weight of the joint.

Check No. 32 on Reply Card for more Details

FAST DRYING INKS: Neehi Protective Coatings Inc., Lindenhurst, N. Y., is producing two fast drying marking inks for use on any type surface. Machine marking inks are offered in a variety of colors for automatic or manual marking and for felt or metal roller feed. Manual marking inks are for free hand marking, stenciling and spraying.

Check No. 33 on Reply Card for more Details

SMOOTH FLOW COUPLINGS: Hansen Mfg. Co., Cleveland 11, O., is offering a line of quick connect and disconnect couplings featuring straight through flow with smooth, unrestricted bore. Sealing is accomplished by an "O" ring. Sizes from ¼ to 2½ inches are manufactured.

Check No. 34 on Reply Card for more Details

PRESSURE-TRIP PUNCH: An automatic center punch for glass and hardened steels is a product of Vinco Products, 326 Bond St., Asbury Park, N. J. Model C-20 is 4 inches long and contains a spring-actuated hammer tripped by pressure on the punch, which has a tip of Carboloy cemented carbide. Spring pressure is adjustable between 8 and 20 pounds.

Check No. 35 on Reply Card for more Details

CARBIDE CUTTING BLADES: Triangular in shape, ⅜-inch light duty cutter blades of solid carbide, made by Weddell Tools Inc., Rochester 11, N. Y., are for application to small shell type face mills, solid shank end mills, etc. Blades are locked into a vee in a triangular hole by a lock screw.

Check No. 36 on Reply Card for more Details

WATER DISPLACER: A moisture-free surface on all metals is provided by Metal-Clean Nos. 11 and 12, developed by Metal-Clean Solvent Corp., 1935 North Paulina St., Chicago, Ill. Water is lifted, leaving coating. No. 11 is used as a cold dip. No. 12 is dip, brush or sprayed and is for work to be held in storage.

Check No. 37 on Reply Card for more Details

AIR CIRCULATOR: Fresh'nd-Aire Co., Chicago, Ill., is announcing its model M-351 Man Cooler air circulator, designed for use in factories. Its 1/6-horsepower motor has speeds of 730 and 1050 revolutions per minute. With its 35-inch propeller it moves 10,000 cubic feet of air per minute at 4 feet.

Check No. 38 on Reply Card for more Details

MILD STEEL ELECTRODE: The No. 109 all-position arc welding electrode developed by Wilson Welder & Metals Co. Inc., New York 17, N. Y., is available in five sizes for the welding of mild steel. The class E6012 electrode has a minimum spatter characteristic with either alternating or direct current.

Check No. 39 on Reply Card for more Details

FOR MORE INFORMATION
on the new products and equipment in this section, fill in a card. It will receive prompt attention.

Market Summary

PRICES—Steel and metal products prices are again subject to much speculation as result of General Motors' action in increasing pay scales. While steel producers are noncommittal on the GM move there is considerable doubt as to whether they can maintain industry's anti-inflation program—holding the line on wages and cutting prices. However, the way is clear for the steel industry to make revisions in both wages and prices. At the time the leading producer made its anti-inflation announcement it emphasized the program was an experiment subject to any changes later seen necessary. Even though the steel industry does not abandon its anti-inflation program, it was generally agreed by observers that the recent wage advances in the automotive industry, coupled with increased production costs stemming from railroad freight rate advances, will tend to slow further steel price reductions.

STEEL SUPPLY—Currently, however, steel consumers generally regard prices secondary to available supply, for demand still runs far ahead of output. Tending to make the demand-supply situation even tighter is the prospect that 4 million tons will be channeled into assistance programs. Already allocations of 160,000 tons of steel for atomic energy projects and 212,000 tons for home heating equipment have been approved, these programs beginning July 1 and running through next February. These tonnages are small in relation to total steel production and the home heating equipment allotment is not greatly in excess of tonnage already going into such end use. Greatest impact of the home heating equipment allotment reportedly will be on heavy hot-rolled carbon sheets, a product in strong demand in connection with the railroad freight car building program. Meanwhile, the whole steel supply picture is clouded by a possible coal miners' strike at the end of June, before effects of the recent walkout have faded.

PRICING—F.o.b. mill pricing of steel which took on wide significance with the increase in rail freight rates and the recent U. S. Supreme Court ruling against multiple basing point pricing in the cement industry case has been adopted by another small steel company which explains freight absorption has become too burdensome.

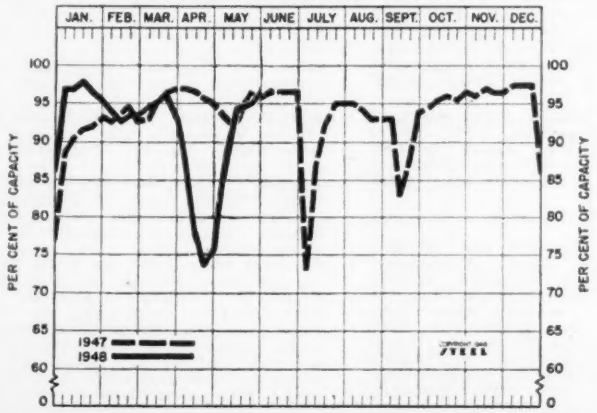
WAREHOUSES—Continued heavy demand and depleted and unbalanced stocks characterize the warehouse situation. Consumers are reported turning in increasing numbers to warehouses in an attempt to make up steel deficiencies stemming from inadequate mill quotas or allotments cut as result of the coal strike. Prospects for improvement in warehouse stocks are not bright, for distributors' third-quarter quotas have been reduced along with those of other mill customers.

SCRAP—Good flow of iron and steel scrap since the end of winter weather has bolstered mill inventories, with a result consumers increasingly insist that preparation and grading be improved and back up their demands with rejections of unsatisfactory material. Although formula prices remain unchanged the improved flow of scrap is reflected in a decrease in reports of over-the-formula payments.

PRODUCTION—Steel mills, boosting ingot production one point further last week, returned to the pre-coal-strike rate of 96 per cent of capacity. Ingot production and blast furnace operations will not be interrupted by the Memorial Day holiday, and any interference with rolling schedules will be quickly overcome.

PRICE COMPOSITES—STEEL's arithmetical price composites held unchanged last week and compared with those for the like 1947 week as follows: Finished steel, $80.27 and $69.82; semi-finished steel, $68.62 and $52.10; steelmaking pig iron, $40.12 and $32.49; and steelmaking scrap, $40.67 and $29.92.

STEELWORKS OPERATIONS



DISTRICT STEEL RATES

Percentage of Ingot Capacity engaged in Leading Districts

	Week Ended May 29	Change	Same Week 1947	Same Week 1946
Pittsburgh	96	+ 0.5	103	27
Chicago	94	+ 0.5	95.5	57.5
Eastern Pa.	90	+ 2	89	34
Youngstown	103	None	93	13
Wheeling	97	— 0.5	81.5	53
Cleveland	97	+ 0.5	93.5	61
Buffalo	93	None	88.5	63
Birmingham	100	None	99	44
New England	78	— 1	95	60
Cincinnati	102	— 4	87	82
St. Louis	85	+ 1	68.5	49.5
Detroit	100	None	90	79
Estimated national rate	96	+ 1	95.5	43

Based on weekly steelmaking capacity of 1,802,476 net tons for 1948; 1,749,928 tons for 1947; 1,762,381 tons for 1946.

COMPOSITE MARKET AVERAGES

Arithmetical Price Composites*

	May 29	May 22	Month Ago Apr. 1948	Year Ago May 1947	5 Years Ago May 1943
Finished Steel	$80.27	$80.27	$81.14	$69.82	$56.73
Semifinished Steel	68.62	68.62	68.72	52.10	36.00
Steelmaking Pig Iron	40.12	40.12	39.21	32.49	23.00
Steelmaking Scrap	40.67	40.67	40.41	29.75	19.17

FINISHED STEEL WEIGHTED COMPOSITE†

Apr. 1948	3.57975¢
Mar. 1948	3.630789¢
Apr. 1947	3.12077¢
Apr. 1943	2.42785¢

***STRAIGHT ARITHMETICAL COMPOSITES:** Computed from average industry-wide base prices on Finished Carbon Steel (hot-rolled sheets, cold-rolled sheets, cold-rolled strip, hot-rolled bars, plates, structural shapes, basic wire, standard nails, tin plate, standard and line pipe), on Semifinished Carbon Steel (re-rolling billets and slabs, sheet bars, skelp, and wire rods), on Basic Pig Iron (at eight leading basing points), and on Steelworks Scrap (No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania). Steel arithmetical composites, dollars per net ton; pig iron and scrap, gross ton.

†**FINISHED STEEL WEIGHTED COMPOSITE:** Computed in cents per pound, base prices, weighted by actual monthly shipments of following products, representing 82 per cent of total steel shipments in the latest month for which statistics are available, as reported by American Iron & Steel Institute: Structural shapes; plates, standard rails; hot and cold-finished carbon bars; black butt weld pipe and tubes; black lap weld pipe and tubes; black electric weld pipe and tubes; black seamless pipe and tubes; drawn wire; nails and staples; tin and terne plate; hot-rolled sheets; cold-rolled sheets; galvanized sheets; hot-rolled strip; and cold-rolled strip. April figure is preliminary.

COMPARISON OF PRICES

Representative market figures for current week; average for last month, three months and one year ago. Finished material (except tin plate) and wire rods, cents per lb; semifinished (except wire rods) and coke, dollars per net ton; others dollars per gross ton.

Finished Materials

	May 29, 1948	Apr. 1948	Feb. 1948	May 1947
Steel bars, Pittsburgh	2.875c	2.90c	2.90c	2.60c
Steel bars, del. Philadelphia	3.365	3.356	3.356	2.98
Steel bars, Chicago	2.875	2.90	2.90	2.60
Shapes, Pittsburgh	2.775	2.80	2.80	2.50
Shapes, del. Philadelphia	2.98	2.968	2.968	2.64
Shapes, Chicago	2.775	2.80	2.80	2.50
Plates, Pittsburgh	2.925	2.95	2.95	2.65
Plates, del. Philadelphia	3.21	3.19	3.19	2.85
Plates, Chicago	2.925	2.95	2.95	2.65
Sheets, hot-rolled, Pittsburgh	2.775	2.80	2.80	2.50
Sheets, cold-rolled, Pittsburgh	3.50	3.55	3.55	3.20
Sheets, No. 10 galv., Pittsburgh	3.90	3.95	3.95	3.55
Sheets, hot-rolled, Gary	2.775	2.80	2.80	2.50
Sheets, cold-rolled, Gary	3.50	3.55	3.55	3.20
Sheets, No. 10 galv., Gary	3.90	3.95	3.95	3.55
Strip, hot-rolled, Pittsburgh	3.05	3.05	2.925	2.50
Strip, cold-rolled, Pittsburgh	3.775	3.80	3.675	3.20
Bright basic, bess. wire, Pittsburgh	3.725	3.775	3.775	3.425
Wire nails, Pittsburgh	5.125	5.20	4.95	4.125
Tin plate, per base box, Pittsburgh	$6.65	$6.70	$6.70	$5.75

Semifinished

Sheet bars, Pittsburgh, Chicago	$60.00	$60.00	$56.79	$44.64
Slabs, Pittsburgh, Chicago	45.00	45.00	42.59	37.51
Rerolling billets, Pittsburgh	45.00	45.00	42.59	37.51
Wire rod 7/32 to 1/4-inch, Pitts.	3.175c	3.175c	3.175c	2.55c

Pig Iron

	May 29, 1948	Apr. 1948	Feb. 1948	May 1947
Bessemer, del. Pittsburgh (N.&S. sides)	$40.996	$40.996	$40.996	$34.83
Basic, Valley	39.00	39.00	39.00	33.00
Basic, eastern del. Philadelphia	42.17	42.004	42.004	35.52
No. 2 fdry., del. Pgh. (N.&S. sides)	40.58	40.496	40.496	34.33
No. 2 fdry., del. Philadelphia	42.67	42.504	42.504	36.02
No. 2 foundry, Chicago	39.00	39.00	39.00	33.00
No. 2 foundry, Valley	39.50	39.50	39.50	33.50
Southern No. 2, Birmingham	39.38	37.88	37.88	29.28
Southern No. 2, del. Cincinnati	45.09	42.23	40.74	34.75
Malleable, Valley	39.50	39.50	39.50	33.50
Malleable, Chicago	39.50	39.50	39.50	33.50
Charcoal, low phos., fob Lyles, Tenn.	58.00	55.00	55.00	40.50
Ferromanganese, fob cars, Pittsburgh	151.00	151.00	151.00	140.25

Scrap

Heavy melt. steel, No. 1, Pittsburgh	$40.25	$40.25	$40.44	$30.00
Heavy melt. steel, No. 2, E. Pa.	39.00	39.00	39.125	28.00
Heavy melt. steel, No. 1 Chicago	39.25	39.10	39.125	29.25
Heavy melt. steel, No. 1, Valley	40.25	40.25	40.25	31.55
Heavy melt. steel, No. 1, Cleveland	39.75	39.75	39.75	30.75
Heavy melt. steel, No. 1, Buffalo	43.00	43.00	43.63	32.20
Rails for rerolling, Chicago	52.50	49.50	51.00	34.50
No. 1 cast, Chicago	69.00	68.40	66.00	38.50

Coke

Connellsville, beehive furnace	$13.00	$12.50	$12.50	$9.125
Connellsville, beehive foundry	15.125	14.875	14.78	10.375
Chicago, oven foundry, del.	20.75	19.25	19.25	16.10

FINISHED AND SEMIFINISHED IRON, STEEL PRODUCTS

Finished steel quoted in cents per pound and semifinished in dollars per net ton, except as otherwise noted. Prices apply on an individual producer basis to products within the range of sizes, grades, finishes and specifications produced at its plants. Delivered prices do not include the 3 per cent federal tax on freight.

Semifinished Steel

Carbon Steel Ingots: Rerolling quality, standard analysis, open market, $90-$95 per gross ton. Forging quality $46 per net ton, Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Buffalo, Youngstown.

Alloy Steel Ingots: Pittsburgh, $56 per gross ton.

Rerolling Billets, Blooms, Slabs: Pittsburgh, Chicago, Gary, Buffalo, Birmingham, $45 per net ton; Cleveland, $47 per net ton; sales by smaller interests on negotiated basis at $85 per gross ton, or higher.

Forging Quality Billets, Blooms, Slabs: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Birmingham, $54 per net ton.

Alloy Billets, Slabs, Blooms: Pittsburgh, Chicago, Buffalo, Bethlehem, Canton, Massillon, $66 per gross ton.

Sheet Bars: Pittsburgh, Chicago, Cleveland, Buffalo, Canton, Youngstown, $60 nom., per net ton; sales in open market $95-105 per gross ton.

Skelp: Pittsburgh, 2.85-2.90c; Youngstown, 2.90c per lb.

Tube Rounds: Pittsburgh, Chicago, Gary, Cleveland, $69-70 per net ton; some sellers quoting up to $120 per gross ton.

Wire Rods: Pittsburgh, Chicago, Birmingham, 7/32 to 1/4-in., inclusive, $2.80-3.55 per 100 lb. 7/32 to 47/64-in., inclusive, $2.75, Cleveland; Galveston, $2.95; Worcester, $2.90-2.95. San Francisco (base del.), $3.5245.

Bars

Hot-Rolled Carbon Bars (O.H. only) and Bar-Size Shapes under 3-in. (Base 20 tons one size): Pittsburgh, Youngstown, Chicago, Gary, Birmingham, 2.85-2.90c; Cleveland, Buffalo, 2.90c; Detroit, del., 3.11c: eastern Mich., 3.18c New York, del., 3.43c; Phila., del., 3.34-3.39c; San Francisco (base, del.), 3.5845-3.95c; Los Angeles (base, del.), 3.579-3.86c; Seattle, 3.8375-3.85c, base.

Rail Steel Bars: Same basing points as merchant carbon bars. Prices upon application.

Hot-Rolled Alloy Bars (Base 20 tons one size): Pittsburgh, Youngstown, Chicago, Gary, 3.20-3.30c; Canton, Massillon, Buffalo, Bethlehem, 3.30c. (Texas Steel Co. uses Chicago base price as maximum fob Fort Worth, Tex., price on sales outside Texas, Oklahoma.)

Cold-Finished Carbon Bars (Base 40,000 lb): Pittsburgh, Chicago, Gary, Cleveland, Buffalo, 3.45-3.55c; Detroit, del., 3.61c; Toledo, 3.68c.

Cold-Finished Alloy Bars: Pittsburgh, Chicago, Cleveland 4.00-4.10c; Gary, Buffalo, Canton, base 4.10c; Worcester, 4.20c.

Reinforcing Bars (New Billet): Pittsburgh, 2.70-2.75c; Chicago, Gary, Youngstown, Birmingham, 2.70; Sparrows Point, Buffalo, base 2.75c; San Francisco (base, del.), 3.3345c; Los Angeles (base, del.), 3.329c; Seattle, 3.88c-4.18c base.

Iron Bars: Single refined: Pittsburgh 7.70c (hand puddled), Economy, Pa., 8.65c. Double refined: Pittsburgh 9.75c (hand puddled), Economy, Pa., 10.00c. Staybolt: Pittsburgh 11.25c (hand puddled), Economy, Pa., 10.20c.

Sheets

Hot-Rolled Sheets (18 gage and heavier): Pittsburgh, Chicago, Gary, Birmingham, Youngstown, 2.75-2.80c; Cleveland, Buffalo, Sparrows Point, Ashland, Ky., base, 2.80c; Detroit, del., 3.01c; eastern Mich., del., 3.08c; Philadelphia, del., 3.06c; New York, del., 3.18c; Los Angeles (base, del.), 3.494-3.544c; San Francisco, (base, del.) 3.4995-3.5495c. (Alan Wood Steel Co., Conshohocken, Pa., quotes 4.20c, Sparrows Point equivalent).

Cold-Rolled Sheets: Pittsburgh, Chicago, Gary, 3.45-3.55c; Cleveland, 3.50-3.55c; Middletown, 3.50c; Buffalo, Youngstown, Sparrows Point, 3.55c; Granite City, 3.65c; Detroit, del., 3.66-3.76c; eastern Mich., del., 3.73-3.83c; New York, del., 3.93c; Philadelphia, del., 3.81c.

Galvanized Sheets, No. 10: (Based on 5 cent zinc) Pittsburgh, Gary, Birmingham, 3.85-3.95c; Chicago, Sparrows Point, Canton, Middletown, 3.95c; Kokomo, 4.55c; Youngstown, 3.95-4.45c; Granite City, 4.35c; New York, del., 4.33c; Philadelphia, del., 4.21c; Los Angeles (base, del.), 4.624c; San Francisco (base, del.), 4.6295c.

Corrugated Galvanized Sheets, No. 10 (Based on 5-cent zinc): Pittsburgh, Chicago, 3.95-4.05c; Gary, Birmingham, Canton, Youngstown, Middletown, 3.95c.

Culvert Sheets, No. 16 flat (based on 5-cent zinc; corrugated 10 cents extra): Copper alloy: 4.45-4.55c, Pittsburgh, Gary, Birmingham; 4.55c Chicago; 4.90c, Kokomo; 5.00c, Granite City; 5.344c (base del.), Los Angeles; 5.3495c (base del.), San Francisco.
Copper-iron or pure iron: 4.80-4.90c, Pittsburgh; 4.80c, Gary; 4.90c, Chicago, Canton; 5.35c, Granite City.

Aluminized Sheets: Hot-dipped, coils or cut to lengths: Pittsburgh, 7.50c.

Long Ternes, No. 10: Pittsburgh, Chicago, Gary, base, 4.05c.

Enameling Sheets, No. 12: Pittsburgh, 3.85-3.95c; Chicago, Gary, 3.75-3.95c; Cleveland, Middletown, 3.85c; Youngstown 3.95c-4.45c; Granite City, 4.05c; Detroit, del., 4.16c; eastern Mich., 4.23c.

Electrical Sheets, No. 24: Field: Pittsburgh, Chicago, Gary, 4.40-4.50c; Kokomo, Ind., 4.60c. **Armature:** Pittsburgh, 4.70-5.30c; Chicago, Gary, 4.70-4.80c; Granite City, Ill., 5.25c; Kokomo, Ind., 4.90c. **Electrical:** Pittsburgh, 5.20-5.80c; Chicago, Gary, 5.20-5.30c; Granite City, Ill., 5.75c; Kokomo, Ind., 5.40c. **Motor:** Pittsburgh, 5.95-6.80c; Chicago, Gary, 5.95-6.05c; Granite City, 6.50c. **Dynamo:** Pittsburgh, 6.65 7.00c; Granite City, 7.20c. **Transformer** 72, 7.15-8.25c; 65, 7.85-9.20c; 58, 8.55-9.90c; 52, 9.35-9.45c, Pittsburgh.

Strip

Hot-Rolled Strip: Pittsburgh, 2.80c-3.30c; Chicago, Gary, Birmingham, Youngstown, Cleveland, 2.75-2.80c; Detroit, del., 3.01c; eastern Mich., del., 3.08c; San Francisco (base, del.), 3.5595c; Los Angeles (base, del.), 3.554c.

Cold-Rolled Strip: 0.25 carbon and less: Pittsburgh, 3.50-4.05c; Cleveland, 3.45-3.85c; Youngstown, 3.55-3.85c; Chicago, Gary, 3.55-3.65c; Detroit, del. 3.66-3.76c; eastern Mich., 3.73-3.83c; Worcester, base, 3.65c.

Cold-Finished Spring Steel: Cleveland base: 0.26-0.40 carbon, 3.55c; over 0.40 to 0.60 carbon, 4.95-5.05c; over 0.60 to 0.80, 5.55-5.65c; over 0.80 to 1.05, 7.05-7.15c; over 1.05 to 1.35, 9.35-9.45c; add 0.20c for Worcester.

Tin, Terne, Plate

Tin Plate: Pittsburgh, Chicago, Gary, per base box of 100 lb, 1.25 lb coating $6.50, 1.50 lb coating $6.70; Sparrows Point, Birmingham and Warren, O., $6.60 and $6.80, respectively; Granite City, $6.70 and $6.90, respectively.

Electrolytic Tin Plate: Pittsburgh, Gary, per base box of 100 lb, 0.25 lb tin, $5.70; 0.50 lb tin, $5.90; 0.75 lb tin $6.10; Sparrows Point, Birmingham and Warren, O., $5.80, $6.00, $6.20, respectively; Granite City, $5.90, $6.10, $6.30, respectively.

Can Making Black Plate: Pittsburgh, Gary, per base box of 100 lb, 55 to 70 lb basis weight, $5.10; 75 to 95 lb basis weight, $5.00; 100 to 128 lb basis weight, $5.10. Birmingham and Warren, O., $5.20, $5.10 and $5.20, respectively.

Holloware Enameling Black Plate: Pittsburgh, Chicago, Gary, base 29-gage, 4.65c per lb; Sparrows Point, Warren, O., 4.75c; Granite City, 4.85c.

Manufacturing Ternes (Special Coated): Pittsburgh, Chicago, Gary, per base box of 100 lb, $5.80; Granite City, Birmingham, Sparrows Point, $5.90; Granite City, $6.

Roofing Ternes: Pittsburgh, per package 112 sheets; 20 x 28 in., coating I.C. 8-lb $15.30.

Plates

Carbon Steel Plates: Pittsburgh, Chicago, Gary, Birmingham, Youngstown, 2.90-2.95c; Cleveland, Sparrows Point, 2.95c; Coatesville, 3.45c; Claymont, 3.65c; Geneva, Utah, 2.90c; Det., del., 3.21c; New York, del., 3.33c; Phila., del., 3.21c; Boston, del., 3.51c; St. Louis, del., 3.269c; San Francisco and Los Angeles, del., 3.493c for sizes and grades produced at Geneva; 3.76c for sizes and grades produced at Fontana, Calif.

(Central Iron & Steel Co., Harrisburg, Pa., 5.10c, basing points.)

Floor Plates: Pittsburgh, 4.05c; Chicago, 3.95-4.05c; Gary, 3.95c; Cleveland, 4.20c.

Open-Hearth Alloy Plates: Pittsburgh, Chicago, Gary, 3.70c; Coatesville, 4.80c.

Clad Steel Plates: Coatesville, 10% cladding: Nickel clad, 21.50c; inconel-clad, 30.00c; monel-clad, 24.00c.

Shapes

Structural Shapes: Pittsburgh, Chicago, Gary, Birmingham, 2.75-2.80c; Buffalo, Bethlehem, 2.80c; New York, del., 3.06c; Phila., del., 2.98c; Geneva, Utah 2.75c; Los Angeles (base, del.), 3.424-3.474c for sizes produced at Torrance, Calif.; Los Angeles and San Francisco, del., 3.343c for sizes produced at Geneva, 3.81c for sizes produced by Bethlehem in East; San Francisco, del., 3.54c for sizes produced at Fontana, Calif.

Beams, Wide Flange: Pittsburgh, Chicago, 2.70c.

Alloy Structural Shapes: Pittsburgh, Chicago, Gary, 3.45-3.55c.

Steel Piling: Pittsburgh, Chicago, Buffalo, $3.30 per 100 lb.

Wire and Wire Products

(Fob Pittsburgh, Chicago, Cleveland and Birmingham per 100 pounds.)

Wire to Manufacturers in carloads

Bright, basic or bessemer *$3.45–4.00
Basic MB Spring (except Birm.).. **$4.85–4.95
Upholstery Spring (except Birm.). †$4.50–4.60

Wire Products to Trade in carloads

Wire, Merchant Quality
Annealed (6 to 8 base) .....††$4.10–4.20
Galvanized (6 to 8 base) .....††$4.55–4.65

(Fob Pittsburgh, Chicago, Duluth, Birmingham, per base column).

Nails

Standard, cement-coated, galvanized.. ‡91–94
Staples, polished and galvanized .... ‡‡91–94
Woven fence, 15½ gage and heavier. §97–100
Barbed wire, 80-rod spool .....§§111–113
Fence Posts (with clamps) ..... ★107
Bale ties, single loop .....★★94-100

* Worcester, $3.55; Duluth, $3.50, base; San Francisco (base, del.) $4.4645 bright basic only.

** Worcester, $4.95; Duluth & Trenton, N.J., $5.10 (bright only); San Francisco (base del.) $5.8845.

† Worcester $4.60; Duluth and Trenton, N. J., $4.75, base. San Francisco (base, del.) $5.5345 black upholstery.

†† One producer quotes 25 cents higher at Birmingham and Chicago; Worcester $4.20, annealed, $4.65, galvanized; Cleveland, annealed, $4.10, galvanized, $4.55 Duluth $4.10, annealed, $4.55, galvanized; Kokomo, Ind., $4.80 annealed, $5.25 galvanized; San Francisco (base, del.) $5.1145 annealed, $5.5645 galvanized.

‡ Cols. 108 and 114 also quoted Pittsburgh; Worcester 97; Cleveland 97; Duluth, 91; San Francisco (base, del.) 112.

‡‡ Cols. 108 and 114 also quoted Pittsburgh; Worcester 97; San Francisco (base del.) 112.

§ Col. 101 also quoted at Pittsburgh; San Francisco (base del.) 120.

§§ San Francisco (base del.) 131.

★ Duluth, 104.

★★ San Francisco (base del.) 118; Chicago, Birmingham, 94-99.

Rails, Supplies

Rails: Standard, over 60-lb fob mill, $2.70-$2.75 per 100 lb. Light rails (billet), Pittsburgh, Birmingham, $3.05 per 100 lb; light rails (rail-steel), Williamsport, Pa., Pittsburgh prices upon application.

Relaying, 60 lb and over fob warehouse $60-$65 per net ton.

Supplies: Track bolts, 7.00c; heat treated, 7.25c. Tie plates $3.55-$3.65 per 100 lb, fob mill; $3.40 base. Seattle: $3.70 fob Pittsburg, Calif. Splice bars $3.75-$3.85 per 100 lb fob mill. Standard spikes, 4.85c; screw spikes, 6.75c. Axles, 4.45-4.50c.

Tubular Goods

Standard Steel Pipe: Base price in carlots, threaded and coupled, to consumers about $200 a net ton. Base discounts Pittsburgh on all types; Lorain on steel butt weld, and seamless; Gary, Ind., 2 points less on steel lap weld and 1 to 2 points less on steel butt weld on sizes produced in that district.

	Butt Weld			Butt Weld	
In.	Blk.	Gal.	In.	Blk.	Gal.
⅛	44½	17	1	52½–53½	36½–37½
¼	44½	21½	1¼	53–54	37–38
⅜	41	17	1½	53½–54½	37½–38½
½	47–48	29½–30½	2	54–55	38–39
¾	50–51	33½–34½	2½, 3..	54½–55½	38½–39½

	Lap Weld		Elec. Weld		Seamless	
In.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
2	44½	28	44	27½	43½	27
2½ & 3	48½	32	47	30½	46½	30
3½-6	50½	34	49	32½	48½	32

Line Steel Pipe: Base price in carlots to consumers about $200 a net ton. Base discounts Pittsburgh and Lorain, O.

In.	Butt Weld	In.	Butt Weld
⅛	43½	1	51½-52½
¼	43½	1¼	52-53
⅜	40	1½	52½-53½
½	46–47	2	53-54
¾	49–50	2½ & 3	53½-54½

In.	Lap Weld	Elec. Weld	Seamless
2	43½	43	42½
2½ & 3	46½	46	45½
3½-6	48½	48	47½
8	50½	50	49½
10	50	49½	49
12	49	48½	48

Standard Wrought Iron Pipe: Base price in carlots, threaded and coupled, to consumers about $200 a net ton. Base discounts Pittsburgh.

	Butt Weld			Lap Weld	
In.	Blk.	Gal.	In.	Blk.	Gal.
⅜	+46½	+74½	1¼	+12	+34½
½	+11	+35	1½	+ 6	+27½
¾	+ 1½	+25	2	— 1½	+20
1 and 1¼	— 4	+16½	2½-3½	— 4	+16
1½	— 9½	+13	4	— 8	+10½
2	—10	+12½	4½-8	— 6	+12
			9-12	+ 3	+21½

Boiler Tubes: Net base prices per 100 ft. fob Pittsburgh, in carload lots, minimum wall thickness, cut lengths 4 to 24 feet, inclusive.

	——Seamless——		—Elec. Weld—	
O.D. Sizes	B.W.G.	Hot Rolled	Cold Drawn	Hot Rolled	Cold Drawn
1"	13	....	$12.21	$11.51	$11.51
1¼"	13	....	14.46	11.48	13.64
1½"	13	$13.72	16.14	12.69	15.22
1¾"	13	15.60	18.37	14.43	17.31
2"	13	17.48	20.57	16.17	19.39
2¼"	13	19.48	22.93	18.02	21.62
2¼"	12	21.46	25.25	19.86	23.80
2½"	12	23.51	27.65	21.75	26.06
2¾"	12	24.91	29.30	23.05	27.63
3"	12	26.15	30.77	24.18	29.00
3¼"	11	30.44	35.82	28.16	33.77
3½"	11	32.68	38.47	30.23	36.27
4"	10	40.57	47.73	37.53	44.99
4½"	9	53.77	63.29	....	....
5"	9	62.25	73.25	....	....
6"	7	95.56	112.44	....	....

Pipe Cast Iron: Class B, 6-in. and over $79.50 per net ton, Birmingham; $84.50, Burlington, N. J.; $91.12, del. Chicago; 4-in. pipe, $5 higher; class A pipe, $5 a ton over Class B.

Bolts, Nuts

Fob Pittsburgh, Cleveland, Birmingham, Chicago; add 19c per cwt in carlots, Lebanon, Pa. Additional discounts: 5 for carloads; 15 for full containers, except tire, step, plow bolts.

Carriage and Machine Bolts

½-in. and smaller; up to 6 in. in length	45 off
⅞ and ⅝ x 6-in. and shorter	46 off
⅝-in. and larger x 6-in. and shorter..	43 off
All diameters longer than 6-in.	41 off
Tire bolts	35 off
Step bolts	43 off
Plow bolts	54 off
Lag bolts	
All diameters 6 in. and shorter....	46 off
All diameters longer than 6 in.	44 off

Stove Bolts

In packages, nuts separate, 65-10 off; bulk 75 off on 15,000 of 3-in. and shorter, or 5000 over 3 in., nuts separate.

Nuts

Semifinished hexagon	A.S. Light	A.S. Reg. and Heavy
⅞-in and smaller	46 off	.....
1⅛-in. and smaller	.....	44 off
½-in.-1-in.	44 off	.....
1⅛-in.-1-in.	.....	43 off
1⅛-in.-1½-in.	42 off	41 off
1⅝-in. and larger	.....	35 off

Additional discount of 15 for full containers.

Hexagon Cap Screws (Packaged)

Upset 1-in. smaller by 6-in. and shorter (1020 bright)	53 off
Upset (1035 heat treated)	
⅝ and smaller x 6 and shorter....	48 off
¾, ⅞, & 1 x 6 and shorter.....	44 off

Square Head Set Screws

Upset 1-in. and smaller	57 off
Headless, ¼-in. and larger	40 off
No. 10 and smaller	52 off

Rivets

Fob Pittsburgh, Cleveland, Chicago, Birmingham

Structural ½-in. and larger ..... Lebanon, Pa. ....5.65c plus 19c per cwt in cl., 26c lcl.	5.65c
⅞-in. and under ..... Lebanon, Pa. ....55 off plus 19c per cwt in cl., 26c lcl.	55 off

Washers, Wrought

Fob Pittsburgh, Chicago, Philadelphia, to jobbers and large nut and bolt manufacturers, lcl ..... $1-$2 off

Tool Steels

Tool Steels: Pittsburgh, Bethlehem, Syracuse, Canton, O., Dunkirk, N. Y., base, cents per lb; reg. carbon 16.00-17.00c; extra carbon 20.60c; special carbon 24.00c; oil-hardening 26.00c; high carbon-chromium 47.00c.

W	Cr	V	Mo	Base Per lb
18.00	4	1	...	82.00c
1.5	4	1	8.5	59.00c
12	3	0.50	...	67.00c
6.40	4.15	1.90	5	63.00c
5.50	4.50	4	4.50	80.00c

Stainless Steels

Base, cents per lb, Pittsburgh, Chicago, and Washington, Pa.

Grade	Bars, Wire, Structurals	Plate	Sheets	Hot Rolled Strip	Cold Rolled Strip
CHROMIUM NICKEL STEELS					
301....	26.00c	29.50c	37.00c	22.00c	28.00c
302....	26.00	29.50	37.00	23.50	30.50
303....	28.50	31.50	39.00	29.50	36.00
304....	27.50	31.50	39.00	25.50	32.50
308....	31.50	37.00	44.50	31.00	38.00
309....	39.00	43.50*	51.00*	40.50	51.00
310....	53.50	56.50†	57.50‡	53.00	61.00
316....	43.50	48.00	52.00	43.50	52.00
321....	31.50	37.00	44.50	32.00	41.50
347....	36.00	41.50	49.00	36.00	45.50
431....	21.00	24.00	31.50	19.00	24.50
440A ..	26.00	31.00	36.50	26.00	30.50
STRAIGHT CHROMIUM STEEL					
410....	20.50	23.50	29.00	18.50	24.00
416....	21.00	24.00	29.50	20.00	25.50
420....	26.00	31.00	36.50	26.00	39.50
430....	21.00	24.00	31.50	19.00	24.50
430F ..	21.50	24.50	32.00	20.50	27.00
442, 443	24.50	28.00	35.50	26.00	35.00
446....	30.00	33.00	39.50	38.00	56.50
§501...	9.00	13.00	17.50	13.00	18.50
§502...	10.00	14.50	18.50	14.50	19.50
****STAINLESS CLAD STEEL (20%)**					
304....	....	24.00	22.00	....	....
410....	....	22.00	20.00	....	....
430....	....	22.50	20.50	....	....
446....	....	29.00	27.00	....	....

One producer quotes: * 6.50c higher, † 3.50c higher, ‡ 10.00c higher. § Low chromium. ** Fob Pittsburgh, Washington and Coatesville, Pa.; plate prices include annealing and pickling.

RAW MATERIAL AND FUEL PRICES

Minimum delivered prices do not include 3 per cent federal tax.

Pig Iron

Per Gross Ton

	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem, Pa., base	$40.00	$40.50	$41.00	$41.50
Newark, N. J., del.	42.39	42.89	43.39	43.89
Brooklyn, N. Y., del.	....	44.40	44.90	....
Philadelphia, del.	42.17	42.67	43.17	43.67
Birmingham, base	38.88	39.38	....	....
Cincinnati, del.	....	45.09	....	....
Buffalo, base	40.00†	40.00†	40.50†	41.00
Boston, del.	48.42	48.42	48.92	....
Rochester, del.	42.22	42.22	42.72	43.22
Syracuse, del.	43.025	43.025	43.525	44.025
Chicago, base	38.50	39.00	39.50	40.00
Milwaukee, del.	40.22	40.72	41.22	41.72
Muskegon, Mich., del.	....	43.98	44.48	....
Cleveland, fob furnace	38.50†	39.00†	39.50†	40.00
Akron, del.	40.67	41.17	41.67	42.17
Duluth, base	39.00	39.50	40.00	40.50
Erie, Pa., base	38.50	39.00	39.50	40.00
Everett, Mass., base	....	45.00	45.50	....
Granite City, Ill., base	45.25	45.75	46.25	....
St. Louis, del.	46.00	46.50	47.00	....
‡Neville Island, Pa., base	39.00	39.50	39.50	40.00
Pittsburgh, del., N.&S. Sides	40.08	40.58	40.58	41.08
Provo, Utah, base	39.00	39.50	....	....
Seattle, Tacoma, Wash., del.	....	46.63	....	....
Portland, Oreg., del.	....	46.63	....	....
Los Angeles, San Francisco.	46.13	46.63	....	....
Sharpsville, Pa., base	39.00	39.50	39.50	40.00
Steelton, Pa., base	40.00	40.50	41.00	41.50
Struthers, O., base	39.50	....	....	....
Swedeland, Pa., base	45.00	45.50	46.00	46.50
Toledo, O., base	38.50	39.00	39.50	40.00
Cincinnati, del.	43.05	43.55	....	....
Youngstown, O., base	39.00	39.50	39.50	40.00
Mansfield, O.	42.87	43.37	43.37	43.87

† Republic Steel Corp. quotes $2.875 higher for No. 2 foundry and malleable and $2.375 higher for basic at Buffalo, and $1.25 higher at Cleveland, effective on shipments during week ended May 30.

‡ To Neville Island base add: $0.86 for McKees Rocks, Pa.; $1.31 Lawrenceville, Homestead, McKeesport, Monaco; $1.73 Verona; $1.94 Brackenridge; $1.08 to Ambridge and Aliquippa.

Blast Furnace Silvery Pig Iron

6.00-6.50 per cent (base)....$49.50
6.51-7.00..$50.75 9.01- 9.50. 57.00
7.01-7.50.. 52.00 9.51-10.00. 58.25
7.51-8.00.. 53.25 10.01-10.50. 59.50
8.01-8.50.. 54.50 10.51-11.00. 60.75
8.51-9.00.. 55.75 11.01-11.50. 62.00

Fob Jackson, O., per gross ton; Buffalo base $1.25 higher. Buyer may use whichever base is more favorable.

Bessemer Ferrosilicon

Prices same as for blast furnace silveryy iron, plus $1 per gross ton.

Electric Furnace Silvery Pig Iron Si 14.01-14.50%, $77.50, Jackson, O.; $78.75, Niagara Falls; $78 open-hearth and $79 foundry grade, Keokuk, Iowa. Add $1 a ton for each additional 0.5% Si to 18%; 50c for each 0.05% Mn over 1%; $1 a ton for 0.045% max. phos.

Charcoal Pig Iron

Semi-cold blast, low phosphorus. Fob furnace, Lyles, Tenn.....$58

(For higher silicon iron a differential over and above the price of base grade is charged as well as for the hard chilling iron, Nos. 5 and 6.)

Gray Forge

Neville Island, Pa. $39.00

Low Phosphorus

Steelton, Pa., Buffalo, Troy, N. Y., $46.00. Philadelphia, $48.81, delivered. Intermediate phosphorus, Central furnace, Cleveland, $42.00.

Differentials

Basing point prices are subject to following differentials:

Silicon: An additional charge of 50 cents a ton for each 0.25 per cent silicon in excess of base grade (1.75% to 2.25%).

Phosphorus: A reduction of 38 cents a ton for phosphorus content of 0.70 per cent and over.

Manganese: An additional charge of 50 cents a ton for each 0.50 per cent, or portion thereof, manganese in excess of 1%.

Nickel: An additional charge for nickel content as follows: Under 0.50%, no extra; 0.50% to 0.74%, inclusive, $2 a ton; for each additional 0.25% nickel, $1 a ton.

Metallurgical Coke

Price per Net Ton

Beehive Ovens

Connellsville, furnace	$12.00-$14.00
Connellsville, foundry	14.00- 16.25
New River, foundry	15.50
Wise county, foundry	14.25
Wise county, furnace	13.50

Oven Foundry Coke

Kearney, N. J., ovens	$20.50
Chicago, outside del.	19.50
Chicago, del.	20.75
Terre Haute, ovens	20.25
Milwaukee, ovens	20.25
New England, del.	21.75
Birmingham, del.	16.71
Indianapolis, ovens	19.50
Cincinnati, del.	20.50
Ironton, O., ovens	18.25
Erie, Pa., del.	21.55
Painesville, O., ovens	20.00
Cleveland, del.	21.55
Buffalo, del.	21.75-22.20
Detroit, del.	20.75
Philadelphia, ovens	19.55
Swedeland, Pa., ovens	19.50
Portsmouth, O., ovens	18.25

Coal Chemicals

Spot, cents per gallon

Pure and 90% benzol	21.00†
Toluol, two degrees	28.00
Industrial xylol	28.00
Solvent naphtha	28.00

Per pound fob works

Phenol (car lots, returnable drums)	13.00
Do., less than carlots	13.75
Do., tank cars	12.00

Eastern plants, per pound

Naphthalene flakes, balls, bbl. to jobbers, "household use"	12.00

Per ton, bulk, fob plants

Sulphate of ammonia	$40.00

† Freight allowed up to 2 cents.

Refractories

Net Prices

Per 1000, fob shipping point

Fire Clay Brick

Super Duty

Pa., Mo., Ky.	$92.00

High Heat Duty

Pa., Mo., Ky.	73.00
Ala., Ga.	73.00
N. J.	78.00

Intermediate Heat Duty

Ohio	67.00
Pa., Mo., Ky.	67.00
Ala., Ga.	59.00
N. J.	70.00

Low-Heat Duty

Pa., Md., Ohio	59.00

Ladle Brick

(Pa., O., Va., Mo.)

Dry Press	50.00
Wire Cut	48.00

Malleable Bung Brick

All bases	83.00

Silica Brick

Pennsylvania	73.00
Joliet, E. Chicago	82.00
Birmingham, Ala.	73.00

Basic Brick

Net tons, fob Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick	64.00
Chem. bonded chrome	64.00
Magnesite brick	86.00
Chem. bonded magnesite	75.00

Magnesite

Domestic dead-burned grains, net ton, fob Chewelah, Wash.

Bulk	27.00
Single bags	31.50

Dolomite

Domestic, dead-burned, bulk, net tons, fob Billmeyer, Blue Bell or Williams, Pa., Millville, W. Va., Nario, Millersville, Martin, Gibsonburg or Woodville, O., $11.85; Midwest (fob Thornton or McCook, Ill.), add $0.10; Missouri Valley (fob Dolly Siding, and Bonne Terre Mo.), add $0.20.

Ores

Lake Superior Iron Ore

Gross ton, 51½% (natural) Lower Lake Ports

(Any increase or decrease in R. R. freight rates, dock handling charges and taxes thereon effective after Apr. 1, 1948, are for buyer's account.)

Old range bessemer	$6.60
Old range nonbessemer	6.45
Mesabi bessemer	6.35
Mesabi nonbessemer	6.20
High phosphorus	6.20

Eastern Local Ore

Cents, units, del. E. Pa.

Foundry and basic 56.62% contract	15.25

Foreign Ore

Cents per unit, cif Atlantic ports

No. African low phos.	Nom.
Swedish basic, 60 to 68%	13.50-14.00
Spanish, No. African basic, 50 to 60%	Nom.
Brazil iron ore, 68-69% fob Rio de Janeiro, nom.	5.50-6.50

Tungsten Ore

Wolframite and scheelite per short ton unit, duty paid	$26-$28

Manganese Ore

48-50%, duty paid, fob cars, New York, Philadelphia, Baltimore, Norfolk, Va., Mobile, Ala., New Orleans, 67.60c-72.60c.

Chrome Ore

Gross ton fob cars, New York, Philadelphia, Baltimore, Charleston, S.C., plus ocean freight differential for delivery to Portland, Oreg., and/or Tacoma, Wash. (S S paying for discharge; dry basis, subject to penalties if guarantees are not met.)

Indian and African	
48% 2.8:1	$37.50
48% 3:1	39.00
48% no ratio	31.00
South African (Transvaal)	
44% no ratio	$25.50-$26.00
45% no ratio	26.50
48% no ratio	29.00-30.00
50% no ratio	29.50-30.50
Brazilian—nominal	
44% to 2.5:1 lump	$33.65
Rhodesian	
45% no ratio	$27-$27.50
48% no ratio	30.00
48% 3:1 lump	39.00
Domestic (seller's nearest rail)	
48% 3:1	$39.00

Molybdenum

Sulphide conc., lb., Mo., cont., Mines	$0.75

Fluorspar

Metallurical grade, fob shipping point, in Ill., Ky., net tons, carloads, effective CaF$_2$ content, 70% or more, $35; less than 60% $32.

HIGH STRENGTH—LOW-ALLOY STEELS

Prices in dollars per 100 pounds

	Pittsburgh	Chicago	Gary	Youngstown	Sparrows Point	Buffalo	Cleveland	Bethlehem	Canton Massillon
Sheet, Hot-Rolled	4.20	4.20-4.30	4.20-4.30	4.20-4.30	4.30	4.30	4.20	...	...
Cold-Rolled	5.20	5.20-5.30	5.20-5.30	5.20-5.30	...	5.30	5.20	...	...
Galvanized	5.90	.....	.....	.....	...	6.00	...	...	...
Strip, Hot-Rolled	4.20	4.30	4.20-4.30	4.20-4.30	...	...	4.20	...	...
Cold-Rolled	5.20	5.30†	5.30†	5.30	...	...	5.20	...	...
Shapes, Structural	4.20	4.20-4.30	4.20	4.30	...	...	...	4.30	...
Plates	4.45	4.45-4.55	4.45-4.55	.....	4.55	...	...	...	...
Bars, Small Shapes	4.35	4.35-4.45	4.35-4.45	4.35-4.45	...	4.45	...	...	4.45

† Nax High Tensile, produced by Great Lakes Steel Corp., quoted 10 cents higher.

WAREHOUSE STEEL PRICES

Prices, cents per pound, for delivery within switching limits, subject to extras.

	SHEETS			STRIP		BARS			PLATES		
	H-R 10 Ga.	C-R 17 Ga.	Gal. *10 Ga.	†H-R	†C-R	H-R Rds. ⅜" to 3"	C-F Rds. ½" & up	H-R Alloy **4140	Structural Shapes‡‡	Carbon ⅜"-¾"	Floor ⅜" & Thicker
New York (city)	4.94	5.80	6.13	5.58	...	5.05	5.78	7.23	4.77	5.09	6.58
New York (c'try)	4.79	5.65	5.98	5.43	...	4.90	...	...	4.62	4.94	6.43
Phila. (city) ..	4.67	5.81	5.90	5.16	5.72	4.87	5.75	8.65	4.57	4.85	6.36
Phila. (c'try.) .	4.52	5.66	5.75	4.81	5.57	4.73	...	...	4.47	4.71	6.21
Wash. (city) ..	4.81	...	...	5.08	...	5.14	5.79	...	4.98	5.03	6.68
Wash. (c'try.) .	4.71	...	...	4.98	...	5.04	...	...	4.88	4.93	6.58
Balt. (city) ...	4.27†	5.59	5.62	4.79	...	4.84	5.66	...	4.69	4.72	6.09
Balt. (c'try.) .	4.12†	5.44	5.40	4.64	...	4.69	...	...	4.54	4.57	5.94
Norfolk, Va. ..	4.90	...	...	...	...	5.20	6.00	...	5.15	5.15	6.90
Memphis (c'ty)	4.91[20]§	5.98[8]†	...	5.11[20]	...	5.01[20]	5.88	...	5.01[20]	5.21[20]	6.83[20]
Memphis (c'try)	4.81[20]§	5.88[8]†	...	5.01[20]	...	4.91[20]	5.78	...	4.91[20]	5.11[20]	6.73[20]
Buffalo (city) .	4.25	5.20[5]	6.05	5.25	5.97	4.40	5.10	6.85	4.40	5.00	6.25
Buffalo (c'try.)	4.10	5.05[5]	5.50	4.70	5.82	4.25	4.95	6.85	4.25	4.45	5.75
Pitts. (city) ..	4.20-4.25§	5.05-5.10[8]†	5.60-5.65	4.30-4.35	5.35	4.35-4.40	5.05-5.10	6.85	4.35-4.40	4.55-4.60	5.80-5.90
Pitts. (c'try) ..	4.05-4.10§	4.85-4.95[8]†	5.40-5.50	4.15-4.20	5.20	4.20-4.25	4.85-4.95	6.85	4.20-4.25	4.40-4.45	5.65-5.75
Cleve. (city) ..	4.40	5.10[8]	5.84	4.52	5.25	4.35	5.10	7.14	4.67	4.55	5.80
Cleve. (c'try.) .	4.25	4.95[8]	...	...	5.10	4.20	4.85	...	...	4.40	5.65
Indianapolis ...	4.52	5.01[8]	5.96	4.62	5.87	4.67‡‡	5.52	8.85	4.67	4.87	6.17
Chicago (city) .	4.40	5.10[8]	5.55-5.65	4.30	5.35	4.35	5.00	6.70[9]	4.35	4.55	5.80
Chicago (c'try.)	4.25	4.95[8]	5.40-5.50	4.15	5.20	4.20	4.85	6.70[9]	4.20	4.40	5.65
Milwaukee	4.62	5.32[8]	5.77-5.87	4.52-5.02	5.57	4.57	5.334	7.184[9]	4.57	4.77	6.02
St. Paul, Minn..	4.66[6]	5.56[8]†	6.01[6]	4.76	6.29[12]	4.81[6]	5.94[11]	7.84[11]	4.81[6]	5.01[6]	6.26[6]
Birming. (c'try.)	4.45[20]§	...	5.65	4.45[20]	...	4.40[20]	6.09	...	4.40	4.65	6.99
Birming. (city).	4.30[20]§	...	5.50	4.30[20]	...	4.25[20]	...	...	4.25	4.50	...
Houston, Tex. .	5.75	...	7.36	6.00	...	5.70	7.00	9.25[9]	5.70	5.90	7.20
Seattle, Wash..	5.30-5.45[17]§	7.10[8]‡	6.95-7.10[17]	5.60-6.15[17]	...	5.45-5.65[17]	7.35[19]	8.50-8.70[12]	5.15-5.30[17]	5.45-5.60[17]	7.50-7.65[17]
Tacoma	5.30-5.45[17]§	7.10[8]‡	6.95-7.10[17]	5.60-6.15[17]	...	5.45-5.65[17]	7.35[19]	8.50-8.70[12]	5.15-5.30[17]	5.45-5.60[17]	7.50-7.65[17]

Base Quantities: 400 to 1999 lb except as noted: Cold-rolled strip, 2000 lb and over; cold finished bars, 1000 lb and over; galvanized sheets, 450 to 1499 lb; [1]—1500 lb and over; [2]—1000 to 4999 lb; [3]—450 to 39,999 lb; [4]—three to 24 bundles; [5]—450 to 1499 lb; [6]—400 to 14,999 lb; [8]—400 to 1499 lb; [9]—1000 to 1999 lb; [11]—1000 to 39,999 lb; [12]—1000 lb and over; [15]—2000 lb and over; [17]—300 to 9999 lb; [18]—1500 to 1999 lb; [19]—1500 to 39,999 lb; [20]—400 to 3999 lb; [21]—400 lb and over; [22]—500 to 1499 lb.

* Includes gage and coating extra, except Birmingham (coating extra excluded); † does not include gage extras; ‡ 15 gage; § 18 gage and heavier; ** as rolled; †† add 0.40 for sizes not rolled in Birmingham; ‡‡ add 15c per 100 lb for slow moving items; §§ except wide flange beams, which are 0.05c lower.

PRICES OF LEADING FERROALLOYS PRODUCTS

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si). Carlot per gross ton, $52, Palmerton, Pa., $51, Pittsburgh, 16% to 19% Mn., $51 Palmerton, $50, Pittsburgh.

Standard Ferromanganese: (Mn 78-82%, C 7% approx.). Carload, lump, bulk $145 per gross ton of alloy, carload packed $157, ton lot $172, less ton $189; fob New Orleans, Mobile, Philadelphia, Baltimore, or New York. Carload, lump, bulk $151, fob cars Pittsburgh, including 50c switching charge. Add, or subtract, $1.80 for each 1%, or fraction thereof, of contained manganese over 82% or under 78%.

West Coast Prices: Carload (80,000 lb or more), lump, bulk, same price and basing points as above. All other prices for shipment from Pacific Coast warehouses, add $26.21 to above prices. Delivery is fob Portland, Los Angeles, South San Francisco, or Seattle warehouses, with railroad freight allowed on shipments of 25 gross tons or more.

Low-Carbon Ferromanganese, Regular Grade: (Mn 80-85%). Eastern Zone, carload, lump, bulk, max. 0.10% C, 22.5c per lb of contained Mn, carload packed 23.25c, ton lot 24.35c, less ton 25.55c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.7c for c.l. and 4.4c for l.c.l. Freight allowed. Deduct 0.5c for max. 0.15% C grade from above prices, 1c for max. 0.30% C, 1.5c for max. 0.50% C, and 4.5c for max. 0.75% C—max. 7% Si. **Special Grade:** (Mn 90% approx., C 0.07% max., P 0.06% max.). Add 0.5c to above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max., Si 1.5% max.). Eastern Zone, carload, lump, bulk 16.5c per lb of contained Mn, carload packed 17.25c, ton lot 18.35c, less ton 19.55c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.7c for c.l. and 4.4c for l.c.l. Freight allowed. Spot, add 0.25c.

Manganese Metal: (Mn 96% min., Fe 2% max., Si 1% max., C 0.20% max.). Eastern Zone, carload, 2" x D, bulk 32c per lb of metal, carload packed 32.5c, ton lot 34c, less ton 36c; Central, add 1c for c.l. and 1.45c for l.c.l.; Western, add 1.45c for c.l. and 2.4c for l.c.l. Freight allowed. Spot, add 2c.

Silicomanganese: (Mn 65-70%). Eastern Zone, contract, lump, bulk, 1.50% C grade, 17-20% Si, 7.8c per lb of alloy, carload packed, 8.55c, ton lot 9.45c, less ton 10.45; Central, add 0.25c for c.l. and 0.6c for l.c.l.; Western, add 0.8c for c.l. and 2.5c for l.c.l. Freight allowed. For 2.0% C grade, Si 15-17%, deduct 0.2c from above prices. Spot, add 0.25c.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Eastern Zone, contract, c.l., lump, bulk 18.6c per lb of contained Cr, c.l., packed 19.5c, ton lot 20.65c, less ton 22.05c; Central, add 0.4c for c.l. and 1.3c for l.c.l.; Western, add 0.55c for c.l. and 2.1c for l.c.l. Freight allowed. Spot, add 0.25c.

"SM" High-Carbon Ferrochrome: (Cr 60-65%, Si 4-6%, Mn 4-6%, C 4-6%). Add 1.1c to high-carbon ferrochrome prices.

Foundry Ferrochrome: (Cr 62-66%, C 5-7%). Eastern Zone, contract, c.l., SMxD, bulk 20.1c per lb of contained Cr, c.l., packed 21.0c, ton lot 22.35c, less ton 24.1c; Central, add 0.4c for c.l. and 1.3c for l.c.l.; Western, add 0.55c for c.l. and 2.1c for l.c.l. Freight allowed. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%). Eastern Zone, contract, carload, lump, bulk, max. 0.03% C 28.5c per lb of contained Cr, 0.04% C 27.5c, 0.05% C 27.0c, 0.06% C 26.5c, 0.10% C 26.0c, 0.15% C 25.5c, 0.20% C 25.25c, 0.50% C 25.0c, 1% C 24.5c, 2% C 24.25c. Carload packed add 1.1c, ton lot add 2.2c, less ton add 3.9c; Central, add 0.4c for c.l. and 0.65c for l.c.l.; Western, add 0.5c for c.l. and 1.85c for l.c.l. Freight allowed. Spot, add 0.25c.

"SM" Low-Carbon Ferrochrome: (Cr 62-66%, Si 4-6%, Mn 4-6%, add C 1.25% max.). Eastern Zone, contract, carload, lump, bulk 25c per lb of contained chromium, carload, packed 26.1c, ton lot 27.3c, less ton 29.1c; Central, add 0.4c for c.l. and 0.65c for l.c.l.; Western, add 0.5c for c.l. and 1.85c for l.c.l. Freight allowed. Spot, add 0.25c.

Low-Carbon Ferrochrome, Nitrogen Bearing: Add 2c to 0.10% C low-carbon ferrochrome prices for approx. 0.75% N. Add 2c for each 0.25% of N above 0.75%.

Chromium Metal: (Mn. 97% Cr and 1% Fe). Eastern Zone, contract, carload, 1" x D, packed, max. 0.50% C grade, 93c per lb of contained chromium, ton lot 94.5c, less ton 97c; Central, add 1.5c for c.l. and 2.5c for l.c.l.; Western, add 2.75c for c.l. and 4.5c for l.c.l. Freight allowed. Spot, add 5c.

SILICON ALLOYS

50% Ferrosilicon: Eastern Zone, contract, carload, lump, bulk 9.3c per lb of contained Si, carload packed 10.9c, ton lot 12.35c, less ton 14.0c; Central, add 0.5c for c.l. and 1.25c for l.c.l.; Western, add 0.7c for c.l. and 1.8c for l.c.l. Freight allowed. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (All 0.40% max.) Add 1.3c to 50% ferrosilicon prices.

75% Ferrosilicon: Eastern Zone, contract, carload, lump, bulk 11.8c per lb of contained Si carload packed 13.1c, ton lot 14.25c, less ton 15.5c; Central, add 0.3c for c.l. add 0.75c for l.c.l.; Western, add 1.05c for c.l. and 5c for l.c.l. Freight allowed. Spot, add 0.3c.

85% Ferrosilicon: Eastern Zone, contract, carload, lump, bulk 13.3c per lb of contained Si, carload packed 14.55c, ton lot 15.55c, less ton 16.7c; Central, add 0.3c for c.l. and 0.7c for l.c.l.; Western, add 1.05c for c.l. and 4.4c for l.c.l. Freight allowed. Spot, add 0.25c.

Low-Aluminum 85% Ferrosilicon: (Al 0.50% max.). Add 0.7c to 85% ferrosilicon prices.

90% Ferrosilicon: Eastern Zone, contract, carload, lump, bulk, 15c per lb of contained Si carload packed 16.2c, ton lot 17.15c, less ton 18.2c; Central, add 0.3c for c.l. and 0.65c for l.c.l.; Western, add 1c for c.l. and 4c for l.c.l. Freight allowed. Spot, add 0.25c.

Low-Aluminum 90-95% Ferrosilicon: (Al 0.50% max.). Add 0.7c to above 90-95% ferrosilicon prices.

Silicon Metal: (Over 97% Si and 1% max. Fe.) Eastern Zone, c.l., lump, bulk, regular 17.3c per lb of Si, c.l. packed 18.5c, ton lot 19.4c, less ton 20.4c; Central, add 0.6c for c.l. and 2.25c for l.c.l.; Western, add 1.2c for c.l. and 4c for l.c.l. Add 1c for max. 0.20% calcium grade. Add 1.5c for max. 0.10% calcium grade. Deduct 0.4c for max. 2% Fe grade analyzing over 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe) Contract basis fob Niagara Falls, N. Y., lump per lb cl 6.90c; ton lots packed, 7.40c; 200 to 1999 lb, 8.15c; smaller lots, 8.65c. Spot up 0.5c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3% lb each and containing exactly 2 lb of Cr). Eastern Zone, contract, carload, bulk, 12.5c per lb or briquet, carload packed 13.2c, ton lot 14.0c, less ton 14.9c; Central, add 0.25c for c.l. and 0.9c for l.c.l.; Western, add 0.35c for c.l. and 1.5c for l.c.l. Freight allowed. Add 0.25c for notching. Spot, add 0.25c.

(*Please turn to Page 128*)

Antimony, Mercury Prices Rise

Market for antimony is now highest in 31 years. Advance in mercury is due to decreased supplies following closings of several properties in West

New York—Antimony prices advanced 2 cents a pound, effective May 22, to the basis of 35.00c a pound in bulk, f.o.b. Laredo, Tex., for the 99½ per cent grade. Quicksilver prices advanced last week to $77 a flask for large lots. Other primary metal markets remained firm on continued active demand.

Copper—Consumption of refined copper by fabricators declined 2836 tons during April to 117,331 tons, according to the Copper Institute. During the like 1947 month, consumption totaled 118,849 tons. Producer deliveries to fabricators also declined, amounting to 116,475 tons compared with 122,988 tons in March. Consumption last month, therefore, was 856 tons in excess of intake. Stocks of copper at fabricators' plants on Apr. 30 held steady at 407,742 tons, while unfilled orders increased slightly to 294,307 tons from 292,355 tons in March. At the end of April there was a deficit of 84,895 tons in the consumers' sales position against 85,562 tons at the end of March.

Export market remained strong with sales reported at the equivalent of 22.25c, fas New York, for third quarter shipment. Additional business was done at 21.50c, fas New York.

Brass and Bronze Ingots: Manufacturers of brass and bronge ingots, who account for more than 95 per cent of total industry deliveries, shipped 25,177 tons of ingots to customers during April compared with 24,282 tons in March and 24,577 tons in April, 1947, according to the Brass & Bronze Ingot Institute. Total shipments for the first four months this year averaged 24,736 tons a month compared with 26,145 tons a month for the like period a year ago.

Lead—Shipments of refined lead to domestic consumers by refineries in the United States declined 7250 tons in April to 45,031 tons, the smallest reported since September of last year, according to the American Bureau of Metal Statistics. This brought total shipments for the first four months of this year to 196,476 tons compared with 197,559 tons for the like 1947 period. Tonnage received by cable makers dropped sharply to 10,926 tons from 13,776 tons in March, while that to battery manufacturers declined to 7184 tons from 8646 tons. Production of refined lead declined to 49,652 tons in April from 50,093 tons in the preceding month, making total output for the first four months 194,164 tons compared with 194,345 tons for the like period a year ago. Stocks of refined lead increased to 19,453 tons as of Apr. 30 from 14,837 tons at the end of March.

Although the two-month strike at the San Francisco Co.'s mines in Mexico was settled last week, no substantial improvement in receipts of foreign metal is expected here until July at the earliest. The strike at American Smelting & Refining Co.'s Santa Barbara mines has not yet been settled. A fair tonnage of European corroding lead was sold early in May for shipment to this country at 18.75c, cif New York, excluding the 1 1/16-cent import duty. This represents an appreciable advance over the previous known sales price.

Zinc—Activity in the domestic and export markets continued restricted last week by the limited amount of metal available. While only American Smelting & Refining Co.'s Santa Barbara mines in Mexico remain closed by a strike, a heavier flow of zinc from that country is not expected before the latter part of July. In the meantime, officers of the International Union of Mine, Mill and Smelter Workers—CIO held a conference in Denver May 29 to discuss a crisis confronting the union. John Clark, president, said that every major contract negotiation is at "an impasse."

Tin—The Argentine government has published a decree under which construction of a tin smelter is authorized, according to reports received here. The existing small tin smelter in Buenos Aires has a capacity of about 100 tons of tin a month.

Antimony — Effective May 22, antimony base prices advanced 2 cents a pound, reflecting the steadily rising costs of raw material and labor. The new prices f.o.b. Laredo, Tex., in bulk are as follows: R. M.M. brand, 99½ per cent, 35.00c; Lone Star brand, 35.50c. The previous change in base prices was made on Mar. 15, 1947. The all-time high price of antimony of 45.00c was established in 1916 and the new price is the highest since 1917 when it touched 36.00c a pound.

Mercury — Domestic dealers increased the price of mercury last week to the basis of $77 a flask for lots of 100 flasks and $78 to $81 a flask for small lots. The advance is attributed to decreased supply from domestic sources, due to the closings in recent months of a number of producing properties in the West.

Aluminum Foil Machinery Arrives from Germany

San Francisco — First shipment of machinery for an aluminum foil plant, purchased last fall by Henry J. Kaiser's Permanente Metals Corp. under the German Reparations Agreement, arrived here last week. The plant, first of its kind west of the Mississippi, will be set up in existing buildings at San Jose, and is expected to be in operation by late fall. The foil plant will have a capacity of 500,000 tons of foil a month.

The foil plant, with facilities for color printing, lacquering and embossing foil and gluing it to paper, will be supplied with light gage sheet aluminum from the company's rolling mill at Spokane, Wash.

Bay area location of the new plant was the result of surveys which indicated that the major West Coast markets for foil are in San Francisco and Los Angeles. Permanente Metals Corp. will market the foil on a national scale.

Supreme Court Rules on Aluminum Monopoly Case

Washington — Supreme Court ruled last week that the New York Circuit Court of Appeals has the power to decide whether the New York District Court for the southern district of New York can reopen the question of whether the Aluminum Co. of America has an aluminum ingot monopoly.

In March, 1945, the Circuit Court of Appeals in a Justice Department antitrust case found that Aluminum Co. of America in 1940 had a monopoly of the aluminum ingot market, acquired in violation of the Sherman Antitrust Act. The court said the need to dissolve Alcoa would depend on the shape of the United States aluminum industry after war plants had been disposed of. It left to the District Court the power to determine an exact remedy after a disposal program was formulated.

In April, 1946, the District Court's judgment was entered, part of which reserved jurisdiction until a disposal program was formulated so that the attorney general could apply for dissolution or some other relief and so that Alcoa could apply to the district court "for a determination of the question of whether it still has a monopoly. . ."

In March, 1947, Alcoa asked the district court to set aside the monopoly finding on the ground that the sale of wartime aluminum plants to Alcoa's competitors had restored competitive conditions in the aluminum industry. The government in reply said that the question of Alcoa's monopoly had been decided once and for all; that the only question left was what relief the government should get and that the government was not ready to ask for this relief since it did not believe enough war plants had been disposed of to reveal the permanent peacetime pattern.

Therefore, the government said, Alcoa's petition should be dismissed. It also specifically asked the District Court of Appeals to direct the New York District Court to vacate as much of its April, 1946, judgment as enabled Alcoa to apply for a determination of the monopoly question.

The Circuit Court denied this motion, claiming it did not have jurisdiction and that only the Supreme Court could decide the question. In its ruling last week, the Supreme Court said the Circuit Court was in error and that it still had jurisdiction to enforce its earlier decision.

The Circuit Court had said that the issue raised by the government's request for an order to the District Court had an important bearing on the problem of dissolution; that the judgment on dissolution would eventually be appealed to the Supreme Court; and that any ruling on the question by the Circuit Court would limit the high court's freedom to deal with the dissolution issue.

NONFERROUS METAL PRICES

(Cents per pound, carlots, except as otherwise noted)

Copper: Electrolytic, 21.50c, Conn. Valley; Lake, 21.62½c Conn. Valley.

Brass Ingot: 85-5-5-5 (No. 115) 19.00-19.25c; 88-10-2 (No. 215) 28.00c; 80-10-10 (No. 305) 24.25c; No. 1 yellow (No. 405) 15.25-16.00c. Prices include 25 cents per 100 lb freight allowance.

Zinc: Prime western 12.00c, brass special 12.25c, intermediate 12.50c, East St. Louis; high grade 13.00c, delivered.

Lead: Common 17.30-17.35c; chemical and corroding 17.40c St. Louis.

Primary Aluminum: 99% plus, ingots 15.00c, pigs 14.00c; metallurgical 94% min. 13.50c. Base prices for 10,000 lb and over, fob shipping point, freight allowed.

Secondary Aluminum: Piston alloy (No. 122 type) 19.50-19.75c; No. 12 foundry alloy (No. 2 grade) 19.00-19.25c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 20.00-20.75c; grade 2 19.25-19.75c; grade 3, 19.00-19.50c; grade 4 18.50-19.00c. Prices include freight at carload rate up to 75 cents per 100 lb.

Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb and over, 20.50c, fob Freeport, Tex.

Tin: Grade A, 99.8% or higher (including Straits) 94.00c; grade B, 99.8% or higher, not meeting specifications for grade A, with 0.05% max. arsenic, 93.85c; grade C, 99.65-99.79%, incl., 93.50c; 99.5-99.64% 93.50c grade F, 98-98.99% 92.60c for tin content. Prices are ex-dock, New York, in 5-ton lots.

Antimony: American, 99-99.8% and over but not meeting specifications below, 35.00; 99.8% and over (arsenic 0.05% max.; other impurities, 0.1% max.) 35.50c, fob Laredo, Tex., for bulk shipments.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 33.75c; 25-lb pigs, 35.25c; shot, 36.25c; "F" nickel shot or ingots, for addition to cast iron, 34.25c. Prices include import duty.

Mercury: Open market, spot, New York $77-$81 per 76-lb flask.

Beryllium-Copper: 3.75-4.25% Be, $20.50 per lb contained Be.

Cadmium: "Regular" straight or flat forms, $1.75, del.; Special or patented shapes, $1.80.

Cobalt: 97-98%, $1.65 per lb for 550 lb (keg); $1.67 per lb for 100 lb (case); $1.72 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, New York, 74.62½c per ounce.

Platinum: $98-$101 per ounce.

Palladium: $24 per troy ounce.

Iridium: $110-$120 per troy ounce.

Plating Materials

Chromic Acid: 99.9%, flake, fob Philadelphia, carloads, 22.00c; 5 tons and over 22.50c; 1 to 5 tons, 23.00c; less than 1 ton, 23.50c.

Copper Anodes: Base, 2000 to 5000 lb; fob shipping point, freight allowed: Flat untrimmed, 30.59c; oval, 30.09c; electrodeposited, 29.84c; cast, 29.59c.

Copper Cyanide: 70-71% Cu, 100-lb drums, 44.00c, fob Niagara Falls, N. Y.

Sodium Cyanide: 96-98%, ½-oz ball, in 200 lb drums, 1 to 900 lb, 15.00c; 1000 to 19,900 lb, 14.00c fob Niagara Falls, N. Y.

Copper Carbonate: 54-56% metallic Cu; 50 lb bags, up to 250 lb, 25.00c; over 250 lb, 24.00c, fob Cleveland.

Nickel Anodes: Rolled oval, carbonized, carloads, 48.00c; 10,000 to 30,000 lb, 49.00c; 3000 to 10,000 lb, 50.00c; 500 to 3000 lb, 51.00c; 100 to 500 lb, 53.00c; under 100 lb, 56.00c; fob Cleveland. Add 1 cent for rolled depolarized.

Nickel Chloride: 100-lb kegs, 23.50c; 275-lb, or 500-lb bbls. 21.50c, fob Cleveland.

Tin Anodes: Bar, 1000 lb and over 110.00c; 500 to 999 lb, 110.50c; 200 to 499 lb, 111.00c; less than 200 lb, 112.50c; ball, 1000 lb and over, 112.25c; 500 to 999 lb. 112.75c; 200 to 499 lb, 113.25c; less than 200 lb, 114.75c, fob Sewaren, N. J.

Sodium Stannate: 25 lb cans only, less than 100 lb, to consumers and resellers, 67.4c; 100 or 300 lb drums only, 100 to 500 lb, to consumers 59.2c, to resellers 54.8c; 600 to 1900 lb, to consumers 56.8c, to resellers 52.5c; 2000 to 9900 lb, to consumers 55.0c, to resellers 50.9c; 10,000 lb or more l.c.l., to consumers 53.9c, to resellers 49.9c; carloads, to consumers 52.7c, to resellers 48.7c. Prices fob Sewaren, N. J.

Zinc Cyanide: 100-lb drums 37.25c, fob Cleveland; 37.00c, Detroit; 36.00c, fob Philadelphia.

Stannous Sulphate: Less than 2000 lb, in 100 lb kegs, 96.50c, in 400 lb bbl, 95.50c; more than 2000 lb, in 100 lb kegs, 95.50c, in 400 lb bbl, 94.50c.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Base prices, fob mill.)

Sheet: Copper 33.68c; yellow brass 30.16c; commercial bronze, 95% 33.80c, 90% 33.27c; red brass, 85% 32.23c, 80% 31.70c; best quality 31.09c; Everdur, Duronze, Herculoy or equiv., hot-rolled, 38.56c; nickel silver, 18%, 42.42c; phosphor bronze, grade A, 5%, 52.70c.

Rods: Copper, hot rolled 30.03c, cold drawn 31.03c; yellow brass, free cutting, 24.69c; commercial bronze, 95% 33.49c, 90% 32.96c; red brass, 85% 31.92c, 80% 31.39c.

Seamless Tubing: Copper 33.72c; yellow brass 32.92c; commercial bronze 90% 35.68c; red brass 85% 34.89c, 80% 34.36c.

Wire: Yellow brass 30.45c; commercial bronze, 95% 34.09c, 90% 33.56c; red brass, 85% 32.52c, 80% 31.99c; best quality brass 31.38c.

Copper Wire: Bare, soft, fob eastern mills, c.l. 26.80c, l.c.l. 27.30c; weatherproof, fob eastern mills, c.l. 27.35c, l.c.l. 27.85c; magnet, delivered, c.l. 29.75c-31.13c, 15,000 lb or more 30.00c-31.38c, l.c.l. 30.50c-31.88c.

ALUMINUM

(Base prices, fob shipping point)

Sheets and Circles: 2s and 3s mill finish c.l., fob shipping point.

Thickness Range, Inches	Widths or Diameters, In., Incl.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	24.0	...	...
0.135-0.126	12-48	24.5	...	...
0.125-0.096	12-48	24.5	23.1	26.3
0.095-0.077	12-48	25.0	23.2	26.5
0.076-0.061	12-48	25.5	23.4	26.7
0.060-0.048	12-48	25.7	23.6	27.0
0.047-0.038	12-48	26.1	23.8	27.3
0.037-0.030	12-48	26.4	24.1	27.7
0.029-0.024	12-48	26.8	24.4	28.1
0.023-0.019	12-36	27.4	24.8	28.6
0.018-0.017	12-36	27.9	25.3	29.3
0.016-0.015	12-36	28.6	25.9	30.1
0.014	12-24	29.4	26.6	31.1
0.013-0.012	12.24	30.2	27.3	32.0
0.011	12-24	31.1	28.1	33.1
0.010-0.0095	12-24	32.1	29.0	34.3
0.009-0.0085	12-20	33.2	30.0	35.7
0.008-0.0075	12-20	34.4	31.1	37.1
0.007	12-18	35.7	32.3	38.8
0.006	12-18	37.0	33.5	42.6

* Minimum length, 60 inches. † Maximum diameter, 24 inches.

LEAD

(Prices to jobbers, fob Cleveland, Pittsburgh)

Sheets: Full rolls, 140 sq ft or more, $20.85 per cwt.; add 50c per cwt., 10 sq ft to 140 sq ft; $1.25, less than 10 sq ft; $1, circles and segments. Pipe: Full coils, $20.10 per cwt; cut coils, $20.35. Traps and Bends: List price plus 52%.

ZINC

Sheets, 16.50c-17.00c, fob mill, 36,000 lb and over. Ribbon zinc in coils, 15.25c-16.00c, fob mill, 36,000 lb and over. Plates, not over 12-in., 14.25c; over 12-in., 15.25c.

NICKEL

(Base prices, fob mill.)

Sheets, cold-rolled, 54.00c. Strip, cold-rolled, 60.00c Rods, hot-rolled 50.00c, cold-finished 55.00c. Angles, hot-rolled, 50.00c. Plates, 52.00c. Seamless tubes, 83.00c.

MONEL

(Base prices, fob mill.)

Sheets, cold-rolled 43.00c; No. 35, 41.00c. Strip, cold-rolled, 44.00c. Rods, hot-rolled 39.00c; cold-finished 44.00c. Angles, hot-rolled, 39.00c. Plates, 41.00c. Seamless tubes, 71.00c. Shot and blocks, 31.00c.

MAGNESIUM

Extruded Rounds, 12 in. long, 1.312 in. in diameter, less than 25 lb, 52.00-56.00c; 25 to 99 lb, 42.00-46.00c; 100 lb to 4000 lb. 35.00-36.00c.

Scrap Metals

BRASS MILL ALLOWANCES

(Based on 21.50c, Conn., for copper)

Prices in cents per pound for less than 15,000 lb fob shipping point.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	19.125	19.125	18.375
Yellow brass	15.625	15.375	14.750
Commercial Bronze			
95%	18.125	17.875	17.375
90%	17.625	17.375	16.875
Red brass			
85%	17.500	17.250	16.750
80%	17.250	17.000	16.500
Best Quality (71-79%)	16.625	16.375	15.875
Muntz Metal	14.750	14.500	14.000
Nickel silver, 5%	16.500	16.250	8.250
Phos. bronze, A. B.	20.750	20.500	19.500
Naval brass	15.250	15.000	14.500
Manganese bronze	15.250	15.000	14.375

BRASS INGOT MAKERS BUYING PRICES

(Cents per pound, fob shipping point, carload lots)

No. 1 copper 18.25, No. 2 copper 17.25, light copper 16.25, composition red brass 14.50-14.75, auto radiators 11.75-12.00, heavy yellow brass 10.50-10.75, brass pipe, 11.50-11.75.

REFINERS' BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 18.50, No. 2 copper 17.50, light copper, 16.50, refinery brass (60% copper), per dry copper content 16.75.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots or more)

Copper and Brass: Heavy copper and wire No. 1 16.50-16.75, No. 2 15.50-16.00, light copper 14.50-14.75, No. 1 composition red brass 12.75-13.00, No. 1 composition turnings 12.25-12.50, mixed brass turnings 7.25-7.50, new brass clippings 12.50-13.00, No. 1 brass rod turnings 10.00-10.50, light brass 6.50-7.00, heavy yellow brass 9.00-9.25, new brass rod ends 10.50-11.00, auto radiators, unsweated 10.00-10.25, cocks and faucets 10.00-10.25, brass pipe 10.00-10.25.

Lead: Heavy 15.00-15.25, battery plates 9.50-9.75, linotype and stereotype 16.00-16.50, electrotype 13.50-14.00, mixed babbitt 14.25-14.75, solder joints, 17.25-17.75.

Zinc: Old zinc 5.75-6.00, new die cast scrap 4.75-5.25, old die cast scrap 2.75-3.25.

Tin: No. 1 pewter 60.00-62.00, block tin pipe 77.00-78.00, auto babbitt 46.50-47.00, No. 1 babbitt 46.50-48.00, siphon tops 45.00-47.00.

Aluminum: Clippings 2S 10.00-10.50, old sheets 8.00-8.50, crankcases 8.00-8.50, borings and turnings 3.25-3.75, pistons, free of struts, 8.00-8.50.

Nickel: Anodes 16.00-17.00, turnings 12.50-13.00, rod ends 16.00-17.00.

Monel: Clippings 12.00-12.50, turnings 7.00-7.25, old sheets 10.00-10.50, rods 10.00-10.50 castings 9.00.

DAILY PRICE RECORD

	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
April Avg.	21.500	17.037	12.000	94.000	15.000	33.000	33.750	74.625
May 1-21	21.500	17.30-17.35	12.000	94.000	15.000	33.000	33.750	74.625
May 22-27	21.500	1730-17.35	12.000	94.000	15.000	35.500	33.750	74.625

NOTE: Copper: Electrolytic, del. Conn. Valley; Lead, common grade, del. E. St. Louis; Zinc, prime western, del. St. Louis; Tin, Straits, del. New York; Aluminum, primary ingots, 99%, del.; Antimony, bulk, fob Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery, unpacked; Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

OPEN MARKET PRICES, IRON AND STEEL SCRAP

Prices are dollars per gross ton, including broker's commission, delivered at consumer's plant except where noted.

PITTSBURGH

No. 1 Heavy Melt. Steel	$40.00-40.50*
No. 2 Heavy Melt. Steel	40.00-40.50*
No. 1 Busheling	40.00-40.50*
Nos. 1, 2 & 3 Bundles	40.00-40.50*
Machine Shop Turnings	36.00-36.50
Mixed Borings, Turnings	36.00-36.50
Short Shovel Turnings.	36.50-37.50
Cast Iron Borings	36.00-37.00
Bar Crops and Plate	47.50-48.00
Low Phos. Steel	47.50-48.00
Heavy Turnings	39.50-40.00

Cast Iron Grades

No. 1 Cupola	64.00-65.00
Charging Box Cast	53.00-54.00
Heavy Breakable Cast.	56.00-58.00
Unstripped Motor Blocks	52.00-53.00
Malleable	69.00-70.00
Brake Shoe	52.00-53.00
Clean Auto Cast	58.00-59.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	41.00-41.50
R.R. Malleable	75.00-80.00
Axles	51.50-52.00
Rails, Rerolling	56.00-58.00
Rails, Random Lengths	54.00-56.00
Rails, 3 ft and under	61.50-62.00
Rails, 18 in. and under	62.50-63.50
Railroad Specialties	54.00-55.00
Uncut Tires	52.00-52.50
Angles, Splice Bars	53.00-54.00

* Plus applicable freight springboard.

CLEVELAND

No. 1 Heavy Melt. Steel	$39.50-40.00*
No. 2 Heavy Melt. Steel	39.50-40.00*
No. 1 Busheling	39.50-40.00*
Nos. 1 & 2 Bundles	39.50-40.00*
Machine Shop Turnings	34.50-35.00
Mixed Borings, Turnings	34.00-36.00
Short Shovel Turnings.	35.50-36.00
Cast Iron Borings	35.50-36.00
Bar Crops and Plate	44.50-45.00
Punchings & Plate Scrap	44.50-45.00
Heavy Turnings	39.50-40.50
Alloy Free Turnings	37.50-38.50
Cut Structurals	46.00-49.00

Cast Iron Grades

No. 1 Cupola	67.00-69.00
Charging Box Cast	58.00-60.00
Stove Plate	58.00-60.00
Heavy Breakable Cast.	54.00-56.00
Unstripped Motor Blocks	58.00-60.00
Malleable	73.00-75.00
Brake Shoes	52.00-53.00
Clean Auto Cast	68.00-70.00
No. 1 Wheels	58.00-60.00
Burnt Cast	56.00-57.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	40.50-41.50*
R.R. Malleable	73.00-78.00
Rails, Rerolling	57.00-58.00
Rails, Random Lengths	56.00-57.00
Rails, 3 ft and under	61.00-63.00
Cast Steel	56.00-58.00
Railroad Specialties	53.00-55.00
Uncut Tires	56.00-57.00
Angles, Splice Bars	57.00-59.00

* Plus applicable freight springboard.

VALLEY

No. 1 Heavy Melt. Steel	$40.00-40.50*
No. 2 Heavy Melt. Steel	40.00-40.50*
No. 1 Bundles	40.00-40.50*
Machine Shop Turnings	34.50-35.50
Short Shovel Turnings.	36.50-37.00
Cast Iron Borings	36.00-36.50
Low Phos.	46.00-47.50*

Railroad Scrap

No. 1 R.R. Heavy Melt.	40.50-41.50*

* Plus applicable freight springboard.

MANSFIELD

Machine Shop Turnings	$35.00-35.50
Short Shovel Turnings.	37.00-37.50

CINCINNATI

No. 1 Heavy Melt. Steel	$39.50
No. 2 Heavy Melt. Steel	39.50
No. 1 Busheling	39.50
Nos. 1 & 2 Bundles	39.50
Machine Shop Turnings	33.50
Mixed Borings, Turnings	32.50
Short Shovel Turnings.	35.50
Cast Iron Borings	34.50

Cast Iron Grades

No. 1 Cupola Cast	55.00
Charging Box Cast	43.00
Heavy Breakable Cast.	50.00
Stove Plate	47.00
Unstripped Motor Blocks	45.00
Brake Shoes	45.00
Clean Auto Cast	55.00
Drop Broken Cast	60.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	40.50
R.R. Malleable	68.00
Rails, Rerolling	53.00
Rails, Random Lengths	50.00
Rails, 18 in. and under	60.00

DETROIT

(Dealers buying prices, fob shipping point)

No. 1 Heavy Melt. Steel	$35.00-35.50
No. 1 Busheling	35.00-35.50
Nos. 1 & 2 Bundles	35.00-35.50
No. 3 Bundles	35.00-35.50
Machine Shop Turnings	29.00-29.50
Mixed Borings, Turnings	29.00-29.50
Short Shovel Turnings.	30.00-30.50
Cast Iron Borings	30.00-30.50
Punchings & Plate Scrap	40.00-40.50

Cast Iron Grades

No. 1 Cupola Cast	58.00-60.00
Heavy Breakable Cast.	48.00-50.00
Clean Auto Cast	60.00-62.00

BUFFALO

No. 1 Heavy Melt. Steel	$43.00-45.00
No. 2 Heavy Melt. Steel	39.75-40.25
No. 1 Busheling	39.75-40.25
No. 1 & 2 Bundles	39.75-40.25
Machine Shop Turnings	34.75-35.25
Mixed Borings, Turnings	34.75-35.25
Cast Iron Borings	35.50-36.00
Short Shovel Turnings.	35.50-36.00
Low Phos.	44.75-45.75

Cast Iron Grades

No. 1 Cupola	66.00-67.00
Mixed Cupola	63.00-65.00
Heavy Breakable Cast.	55.00-57.00
Malleable	70.00-75.00
Clean Auto Cast	62.00-64.00

Railroad Scrap

Rails, 3 ft. and under.	58.00-60.00
Railroad Specialties	52.00-53.00

PHILADELPHIA

No. 1 Heavy Melt. Steel	$42.00-43.00
No. 2 Heavy Melt. Steel	39.00
No. 1 Busheling	39.00
Nos. 1 & 2 Bundles	39.00
No. 3 Bundles	37.00
Machine Shop Turnings	34.00-35.00
Mixed Borings, Turnings	34.00-35.00
Short Shovel Turnings.	34.00-35.00
Bar Crop and Plate	46.50-47.50
Punchings & Plate Scrap	46.50-47.50
Cut Structurals	46.50-47.50
Elec. Furnace Bundles.	43.50-44.50
Heavy Turnings	42.50-43.00
No. 1 Chemical Borings	42.00-43.00

Cast Iron Grades

No. 1 Cupola Cast	63.00-65.00
No. 1 Machinery Cast.	66.00-67.00
Charging Box Cast	61.50-62.50
Heavy Breakable Cast.	61.50-62.50
Unstripped Motor Blocks	59.50
Malleable	76.00-78.00
Clean Auto Cast	64.00
No. 1 Wheels	68.00-70.00

NEW YORK

(Brokers buying prices, fob shipping point)

No. 1 Heavy Melt. Steel	$34.50
No. 2 Heavy Melt. Steel	34.50
No. 1 Busheling	34.50
Nos. 1 & 2 Bundles	34.50
No. 3 Bundles	32.50
Machine Shop Turnings	28.50-29.00
Mixed Borings, Turnings	28.50-29.00
Short Shovel Turnings.	30.50-31.00
Punchings & Plate Scrap	40.00-41.00
Cut Structurals	40.00-41.00
Elec. Furnace Bundles.	40.00-41.00

Cast Iron Grades

No. 1 Cupola Cast	55.00-57.00
Charging Box Cast	56.00-58.00
Heavy Breakable	56.00-58.00
Unstripped Motor Blocks	52.50-53.50
Malleable	68.00-69.00

BOSTON

(Fob shipping point)

No. 1 Heavy Melt. Steel	$31.90
No. 2 Heavy Melt. Steel	31.90
No. 1 Bundles	31.90
No. 1 Busheling	31.90
Machine Shop Turnings	26.90
Mixed Borings, Turnings	26.90
Short Shovel Turnings.	28.90
Bar Crops and Plate	35.00-37.00
Punchings & Plate Scrap	35.00-37.00
Chemical Borings	37.00-37.50

Cast Iron Grades

No. 1 Cupola Cast	58.00-60.00
Heavy Breakable Cast.	53.00
Stove Plate	52.00
Unstripped Motor Blocks	49.00
Clean Auto Cast	52.00-53.00

CHICAGO

No. 1 Heavy Melt. Steel	$39.00-39.50
No. 2 Heavy Melt. Steel	39.00-39.50
No. 1 Bundles	39.00-39.50
No. 2 Bundles	39.00-39.50
No. 3 Bundles	37.00-37.50
Machine Shop Turnings	34.00-34.50
Mixed Borings, Turnings	34.00-34.50
Short Shovel Turnings.	36.00-36.50
Cast Iron Borings	35.00-35.50
Bar Crops and Plate	46.50-47.00
Punchings	48.00-48.50
Elec. Furnace Bundles.	40.00-40.50
Heavy Turnings	38.50-39.00
Cut Structurals	44.00-44.50

Cast Iron Grades

No. 1 Cupola Cast	68.00-70.00
Clean Auto Cast	68.00-70.00
No. 1 Wheels	62.00-65.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	41.25-44.25
Malleable	76.00-78.00
Rails, Rerolling	52.00-53.00
Rails, Random Lengths	49.00-50.00
Rails, 3 ft and under	56.00-57.00
Rails, 18 in. and under	58.00-59.00
Railroad Specialties	52.00-53.00
Angles, Splice Bars	52.00-53.00

ST. LOUIS

No. 1 Heavy Melt. Steel	$40.50-41.00
No. 2 Heavy Melt. Steel	37.50-38.00
Machine Shop Turnings	32.50-33.50
Short Shovel Turnings.	34.50-35.50

Cast Iron Grades (Fob shipping point)

No. 1 Cupola Cast	65.00-67.00
Mixed Cast	59.00-60.00
Heavy Breakable Cast.	55.00-56.00
Brake Shoes	57.00-58.00
Clean Auto Cast	65.00-67.00
Burnt Cast	59.00-60.00

Railroad Scrap

R.R. Malleable	65.00-70.00
Rails, Rerolling	50.50-52.50
Rails, Random Lengths	50.00-51.00
Rails, 3 ft and under	56.00-58.00
Uncut Tires	48.00-49.00
Angles, Splice aBrs	55.00-56.00

BIRMINGHAM

No. 1 Heavy Melt. Steel	$37.00
No. 2 Heavy Melt. Steel	37.00
No. 1 Busheling	37.00
Nos. 1 & 2 Bundles	37.00
No. 3 Bundles	35.00
Long Turnings	24.50
Short Shovel Turnings.	26.00-27.00
Cast Iron Borings	25.00
Bar Crops and Plate	40.00
Cut Structurals	38.50

Cast Iron Grades

No. 1 Cupola Cast	63.00
Stove Plate	60.00-62.00
No. 1 Wheels	59.00-61.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	38.00
R.R. Malleable	nom.
Axles, Steel	50.00
Rails, Rerolling	53.00-55.00
Rails, Random Length.	45.00-48.00
Rails, 3 ft and under	53.00-55.00
Angles and Splice Bars	52.00-53.00

SAN FRANCISCO

No. 1 Heavy Melt. Steel	*$25.00
No. 2 Heavy Melt. Steel	*25.00
No. 1 Busheling	*25.00
Nos. 1 & 2 Bundles	*25.00
No. 3 Bundles	*20.00
Machine Shop Turnings	*15.50
Bar Crops and Plate	25.00
Cast Steel	25.00
Alloy Free Turnings	15.50
Cut Structurals	25.00
Tin Can Bundles	20.00

Railroad Scrap

No. 1 Heavy Melting	26.00
Axles	32.00
Rails, Random Lengths	26.50
Uncut Tires	33.50

* Fob California shipping point.

SEATTLE

No. 1 Heavy Melt. Steel	$26.00
No. 2 Heavy Melt. Steel	26.00
No. 1 Busheling	26.00
Nos. 1 & 2 Bundles	22.00-23.00
No. 3 Bundles	22.00-23.00
Machine Shop Turnings	14.50-16.50
Mixed Borings, Turnings	14.50-16.50
Punchings & Plate Scrap	26.00-28.00
Cut Structurals	26.00-28.00

Cast Iron Grades

No. 1 Cupola Cast	40.00
Charging Box Cast	25.00
Heavy Breakable Cast.	24.00
Stove Plate	25.50
Unstripped Motor Blocks	24.00
Malleable	30.00
Brake Shoes	30.00
Clean Auto Cast	30.00
No. 1 Wheels	26.50

Railroad Scrap

No. 1 R.R. Heavy Melt.	22.00
Railroad Malleable	30.00
Rails, Random Lengths	21.50
Angles and Splice Bars	23.00

LOS ANGELES

No. 1 Heavy Melt. Steel	$25.00
No. 2 Heavy Melt. Steel	25.00
Nos. 1 & 2 Bundles	25.00
Machine Shop Turnings	16.00
Mixed Borings, Turnings	15.50-16.00
Punchings & Plate Scrap	28.00
Elec. Furnace Bundles.	28.00

Cast Iron Grades

No. 1 Cupola Cast	35.00-36.00

HAMILTON, ONT.

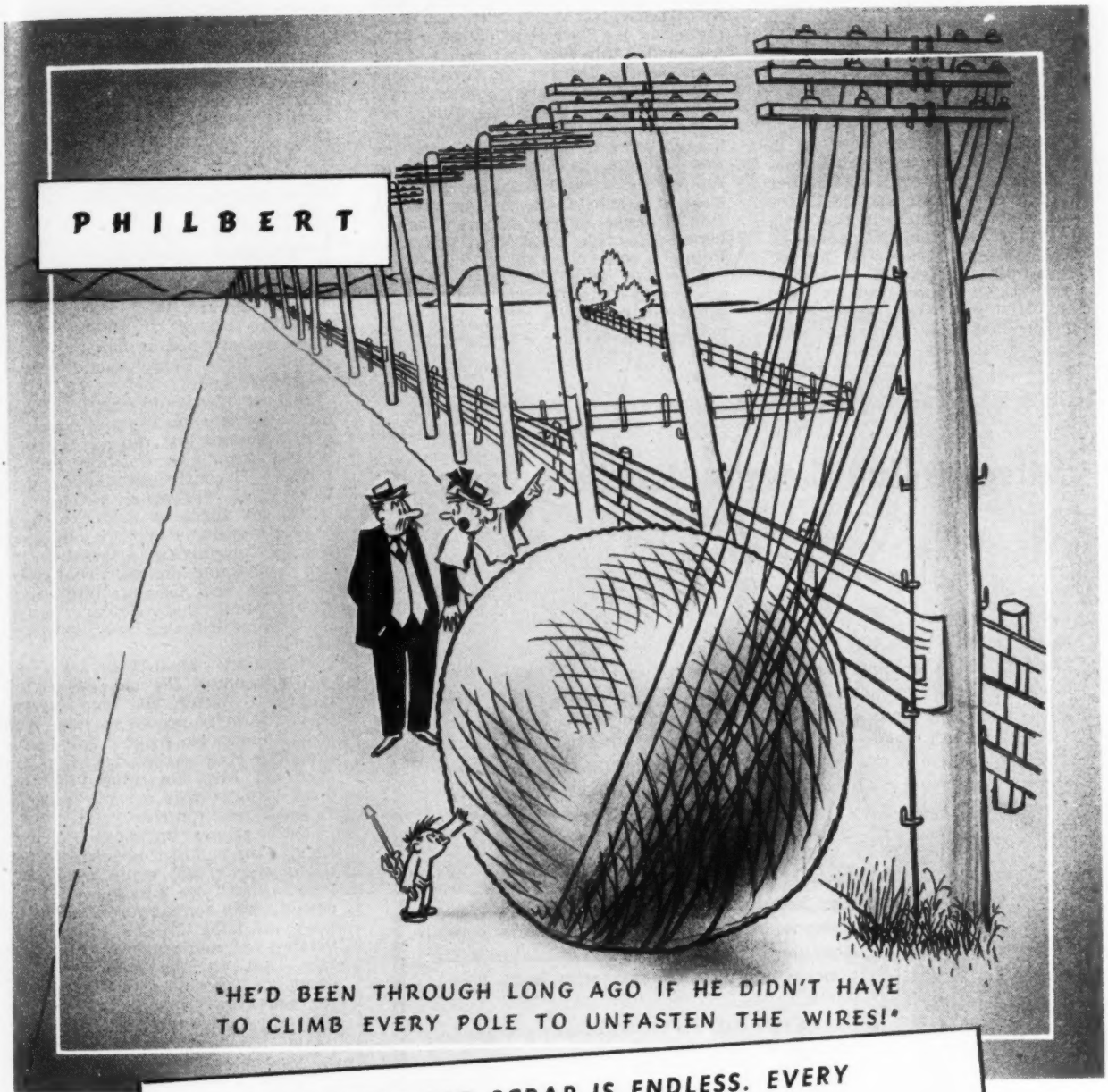
(Ceiling prices, delivered)

Heavy Melt.	$22.00
No. 1 Bundles	22.00
Mechanical Bundles	20.00
Mixed Steel Scrap	19.00
Mixed Borings, Turnings	17.00
Rails, Remelting	28.00
Rails, Rerolling	26.00
Bushelings	17.00
Bushelings, new factory, prep'd	21.00
Bushelings, new factory, unprep'd	16.00
Short Steel Turnings	17.00

Cast Iron Grades*

No. 1 Cast	42.00-48.00
No. 2 Cast	35.00-37.00

* Removed from price control Aug. 9, 1947; quoted on basis of fob shipping point.



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LEADERS IN IRON AND STEEL SCRAP SINCE 1889

Sheets, Strip . . .

Detroit delivered price for cold-finished steel revised in new pricing changes

Sheet Prices, Page 104

Pittsburgh — Reduction of $2 in cold-rolled sheet prices by National Steel Corp. makes its price $3.66 per 100 pounds at Detroit and $3.73 for Eastern Michigan. Mills in this area are not following a uniform policy in shipping cold-rolled sheets to Detroit. For example, Jones & Laughlin has withdrawn from Detroit and Eastern Michigan area, making its cold-rolled sheet base 70 inches wide and narrower at Cleveland, with widths over 70 inches reverting back to Pittsburgh. When National Steel increased its Detroit arbitraries $1 a ton earlier this year, Carnegie did not increase its Detroit delivered price accordingly, continuing to ship into Detroit at $3.71 per 100 pounds. Carnegie has now reduced its Detroit delivered price to $3.66 in line with the new quotations announced by Great Lakes, and is also shipping into the East at a substantial freight absorption because of the recently established price base of $3.55 at Sparrows Point on cold-rolled sheets.

Effective May 22 last Carnegie also revised its Detroit and Eastern Michigan prices on other steel products. Company is no longer selling on an arbitrary price base in these areas, rather its policy now is one of meeting competition and selling on a delivered price basis. Previously Carnegie was selling into Detroit and Eastern Michigan at $1 a ton below prices quoted by Great Lakes, not having advanced prices in line with that put into effect by Great Lakes in April. Thus Carnegie's present price policy of meeting competition on a delivered price basis in effect means higher prices obtained for products affected on shipments into Detroit and Eastern Michigan. Since Great Lakes has not reduced hot-rolled sheets, enameling sheets or hot-rolled bars, the price reductions put into effect on these items by Carnegie are not applicable on shipments into Detroit and Eastern Michigan.

Sellers generally have "blocked out" July schedules to make up carryover tonnage lost during the period of industrial gas shortage and coal strike. Recently established voluntary steel allocation program for warm air furnaces and Atomic Energy Program is expected to further disrupt production schedules. Steel for the Atomic Energy Program represents a new load on mill requirements, while that of warm air furnaces constitutes an increase of about 42,000 tons.

New York—Most sheet sellers have set up quotas for the entire third quarter. Within the past week, at least two large producers have finally set up quotas for August and September, following earlier action with respect to July, for which month no new tonnage was set up except for railroad requirements.

Most sellers anticipate a carryover at the end of this quarter of four to six weeks, and while most of this tonnage will be handled in July, a considerable tonnage will fall in August. Adding to the difficulty of getting out arrearages in July is the fact that various mills may close down for a period of a week or more for mass vacations. Another complicating factor also is the possibility of disruption to operations due to another coal strike.

Stainless steel sheets are being offered by various mills for shipment at anywhere from five to eight weeks, with the situation in general not as tight as it was two months ago. Delivery promises on stainless strip cover a wider range, with one seller now unable to offer anything before fourth quarter.

Boston—There is every indication steel prices, including those for flat-rolled, will continue in a fluid state for some time. Not only are basing point changes a factor, but varying costs with individual producers in making revisions or standing pat at current levels are also given consideration. Some shifts in production and product mix are likely and consumers are showing more concern over new withdrawals of producers from districts to which high freights prevail. At least several prices for the same product are indicated indefinitely. Most producers are meeting the new Sparrows Point base price for delivery of cold-rolled sheets in this territory, although Buffalo continues for certain northern New England points. Demand for flat-rolled continues in excess of supply with consumer inventories low. There

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has been a slump in production of stoves and ranges with some rebound, but no holdup in sheet orders. There have been isolated cancellations on electrical sheets with some decline in pressure for those grades.

Cleveland—Allocation of steel for atomic energy projects and house heating equipment is not viewed here with great alarm except as regards heavy hot-rolled carbon sheets. That product already is in exceptionally tight supply with a considerable tonnage going to the railroad car building program.

While it is recognized the new allocations will impose some additional tightness on steel supply, the allocated tonnages are not huge and the heating equipment allotments are reported to include only a small tonnage in addition to the amount now going into heating equipment.

Cincinnati — Allocations of sheet steel in the third quarter, from district mills, will be smaller according to tentative quotas. The reductions will be enforced by the loss of tonnage this quarter during shutdowns, and do not take into account possibility of further cuts on requirements for government programs. Pressure for sheets is accentuated, with no easy supply in the whole list. Even on stainless the delivery promises are becoming more and more extended.

Philadelphia — Sheet sellers expect the newly approved 212,000-ton voluntary allocation program for air furnace equipment to be divided rather equally over the eight months it has to run, beginning July 1. In other words, tonnage will be shipped at the rate of about 26,500 tons per month. Of this overall total, it is estimated that approximately 95,000 tons will be comprised of cold-rolled sheets and strip, 74,000 tons of galvanized sheets and 43,000 tons of hot-rolled sheets and strip. This program is to speed heating requirements for national housing work.

Only a relatively small amount of sheets will be required for the atomic bomb projects program, recently approved in Washington. Total steel for this program, running over a period of eight months beginning July 1, amounts to 160,000 tons, and includes a variety of items, such as pipe, shapes and plates, as well as sheets. Of the total, 135,000 tons are to be divided about equally between the third and fourth quarters of this year, with the remaining 25,000 tons to be delivered during the first two months of next year.

While these two programs will make further inroads into general quarterly quotas, they should not cut too great a swath. In fact, under anything like ordinary circumstances these programs would be scarcely felt. Most noticeable effect will be in galvanized sheets, because of the relatively small production of this coated material, compared with output of hot and cold-rolled sheets and strip.

Undoubtedly, too, no little amount of this tonnage will be applied against qutoas which had already been set up for various customers in the fields affected. Hence, it will not be a case of all this new tonnage being superimposed on normal allotments.

One large seller of electrical sheets is setting up quotas on a quarterly basis for the period beginning July 1; previously, or at least since the end of the war, this seller has been restricting allotments to a monthly basis.

Chicago — Although numerous manufacturing companies report declining production schedules, due to declining orders and rapidly filling pipelines, some sheet and stripmakers assert they are not receiving cancellatons or hold-backs in steel shipments. This suggests that consumers prefer to accept all material due them under their quotas, at least until there is clearer indication that orders for finished goods will continue on a reduced basis. The complaint of most users of flat-rolled products is that their production schedules have been reduced because of inability to obtain sufficient steel. The price situation continues mixed, but under present conditions of shortage this is of minor importance as compared with steel availability

Birmingham — Sheet users say they are now feeling the recent coal strike because of short inventories occasioned by interruption in shipments. Demand on the other hand, gives no indication of leveling off, and there are persistent reports of reduced quotas for the third quarter.

St. Louis — Granite City Steel Co., this district's principal maker of sheets and other flat steel products, has notified customers the $5.25 pig iron price increase posted a week ago by Missouri-Illinois Furnaces has definitely canceled prospects of a contemplated reduction in finished steel prices and may compel a price boost. Customers are interested, however,

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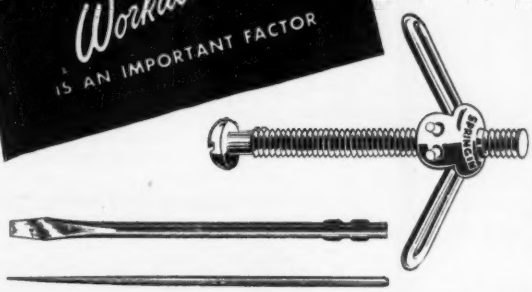

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only in the "when and how much" of deliveries. Output of sheets has risen again to the 50 per cent of capacity plateau which has been maintained most of the year. Adjustments to auxiliary equipment of Granite City's new cold reduction mill will not be finished before mid-July. Meanwhile it has operated 25 to 50 per cent of full speed. Output dropped still further three weeks ago when one open hearth collapsed and the repair interim was used to overhaul the slab mill also. During the period the company piled up a quantity of cold pig and cast scrap on which it is depending to carry it over a 45 or 60-day shutdown of its iron supplier starting July 1. Even with that, sheet production may drop 10 per cent. Sheetmakers are further hampered by low quality scrap. They complain it is almost impossible to make transformer grade electrical sheets from scrap "so light it goes up the chimney." Per day per furnace ingot production is down also for the same reason.

Plates . . .

Plate Prices, Page 105

New York — Plates are now moving perhaps as freely as at any time this year. Most mills have recovered from the disruption of the coal strike this spring and are not being handicapped as they were prior to the strike by seasonal shortages of raw materials, notably scrap, fuel oil and gas. However, producers are still well behind on commitments, with the probability that most will go into the third quarter with a carryover of at least three to four weeks. The mills in setting up their third quarter quotas have allowed for such a carryover. Also, they have allowed for fully as much tonnage for the car program as they did for the current quarter. What they will be able to do against these quotas will depend upon what happens at the coal mines and upon what may develop with respect to European aid and domestic preference needs, particularly for the oil industry. The atomic bomb projects program has been definitely approved, with 160,000 tons, including plates, along with shapes, pipe and sheets, to be supplied during a period of eight months, beginning July 1. It is estimated that of this total, 135,000 tons will be shipped by the end of this year.

Pittsburgh—Demand for alloy steel plates has recorded substantial increase the past week to ten days, reflecting in part heavier buying from the chemical industry. Early this year deliveries on alloy plates were readily available within a short period, but this picture has changed significantly in recent weeks, with some sellers booked as far ahead as on open-hearth alloy bars. Considerable tonnage of alloy plates also is involved in the Atomic Energy Program. Sellers of carbon plates report the supply situation nearly as critical as that of light gage sheets. No let-up in record heavy demand for carbon plates is indicated over the rest of this year for such industries as railroad, line pipe production, and fabrication of storage tanks, heavy machinery and barges.

Price range of $2.90 to $2.95 per 100 pounds on plain plates continues in effect here. Similar price differential of 5 cents per 100 pounds is noted on structurals.

Philadelphia — While most producers have now allocated tonnage for the entire third quarter, at least one large seller has taken no action beyond July and, in this case, most tonnage for that month will represent arrearages from the current quarter. Sellers report increasing pressure from various consuming quarters, including shipyards where activity is again on the upswing following record-breaking performances during the war. Demands from these yards are in no way comparable with those of the war period and as long as the country is at peace there is no indication that they will be. However, present expansion in ship requirements is being especially felt in view of tonnage required in other directions. No action has yet been taken with respect to the proposed petroleum program.

Birmingham — Increased pressure for plates is anticipated here, especially if the defense program makes much headway. Shipyard requirements are steady in the South as are needs of the carbuilding industry. The usual complaint is heard of inability to get small lots as needed.

Seattle — Plants report a fair volume of new business in tanks, vats and boilers but the increasing scarcity of plates is handicapping output and preventing bids on attractive business involving larger tonnages.

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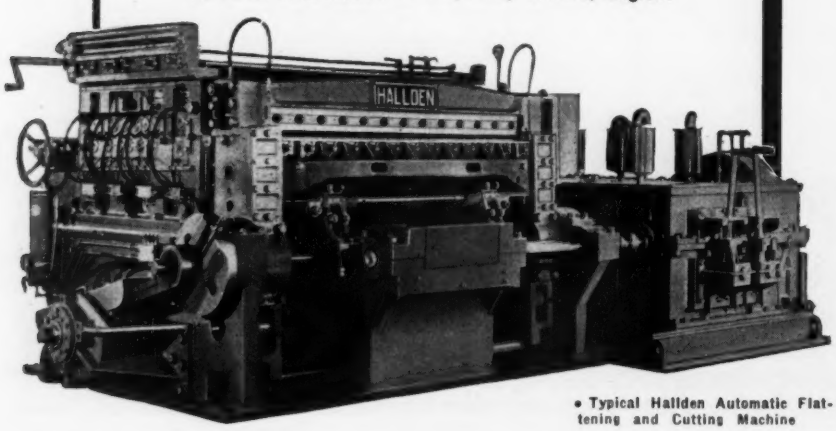

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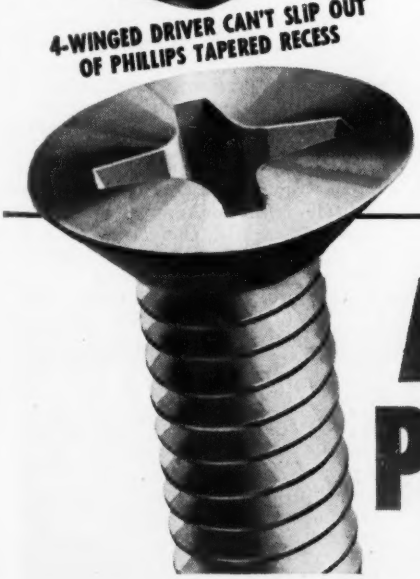

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Steel Bars . . .

Bar Prices, Page 104

New York — Stringency continues in practically all sizes of hot carbon bars. Certain sellers claim that small sizes, and medium sizes, 1½ inches and under, are the scarcest on the list, but that, at the same time, they are unable to keep up with needs for the larger sizes. Most sellers have set up quotas for the entire third quarter and generally on a smaller scale than for the current quarter. Whether overall shipments will be as heavy in the third quarter remains to be seen, much depending upon whether there is another coal strike. If there isn't another such disruption, shipments should be heavier, notwithstanding vacations and hot weather which in general retards production.

Cold-drawn carbon bar shipments are as extended as at any time since the end of the war. Little tonnage is now available before August in any size; one large seller is sold out completely until fourth quarter. Shipments of alloy bars, both hot and cold, are more extended than they were. Some producers have little, if any, tonnage to offer before August.

Pittsburgh — With few exceptions carbon cold-finished bar producers are no longer shipping into Detroit and Toledo at former arbitrary prices. Most sellers are quoting fob Cleveland plus freight. However, Jones & Laughlin is still following former price policy to these destinations, although company has reduced prices 10 cents in line with the same price reduction previously announced at its price base. Earlier this year cold-finishers abolished the Detroit and Toledo price arbitraries on alloy bars.

Sellers note a growing stability in demand for alloy bars, in contrast with sporadic large tonnage purchases reported during January and February. Most mills have been unable to make headway against large order backlogs, with deliveries extended 8 to 10 weeks on electric furnace alloys and into fourth quarter on open-hearth grades. Current heavy demand is spread throughout the entire size range classifications in alloy bars and there is no significant variation in requirements between various product classifications, such as flats and rounds. Increased demand for alloy bars is attributed in part to augmented requirements for the aircraft program and to better balanced sheet inventories among automotive producers, permitting increased assembly schedules. Considerable tonnage is also being shipped to the chemical and petroleum industries. The fact that Copperweld Steel Co. and Rotary Electric Steel Co. are no longer producing alloy bars has placed additional pressure on other producers.

Philadelphia — Demand for hot carbon bars continues in excess of supplies, with no easing in the outlook expected over the next four months at least. Quotas for third quarter are in general lighter than for the current period and there is serious question as to whether overall shipments will be as heavy, especially should there be another coal strike. Demand for cold-drawn carbon bars continues to improve, with sellers having little to offer before August. There is an active demand for practically all sizes of bars, large as well as small and medium, it is said.

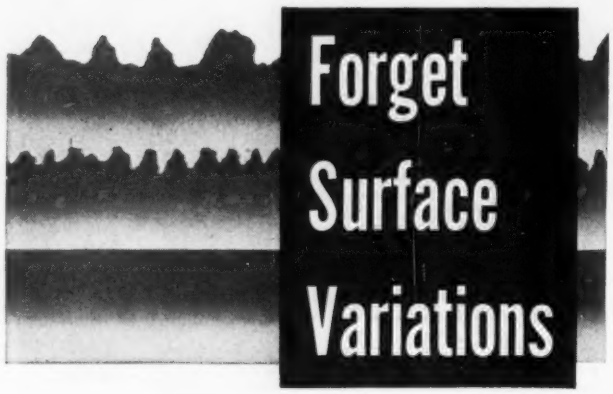
Tubular Goods . . .

Tubular Goods Prices, Page 105

Boston—Impact of production lost early this quarter will be reflected in allocation schedules during the last half; several weeks or up to months will be blanked out. New orders for steel pipe with distributors are slower, but most have backlogs suficient to cover all tonnage in sight. This slackening in orders is in no way reflected at the mill level. Most producers of pressure tubing have no open capacity for the balance of this year; jobbers have quotas and will get that tonnage, but no more. Demand for alloy tubing is strong, notably from makers of anti-friction bearings, while the Navy has bids on 1,279,000 feet in small sizes of chrome-nickel-moly tubing.

Pipe fabricators are booked up to the limit of pipe quotas and some are over-committed at current tonnage; fittings are less stringent with one district producer.

Pittsburgh — Producers have not yet reduced hot-rolled and cold-drawn electric weld boiler tubing, and no action is contemplated at this time, according to one seller. Demand for both seamless and electric weld tubing is heavy, with mills unable to make headway against order backlogs. Pressure tubing supply is par-



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ticularly tight, due at least to some extent to the narrow profit margin on this item. Unprecedented demand for line pipe prompted at least two new companies to enter this field, and a third has such a move under consideration. From a tonnage standpoint, output of these new interests will not be a major factor within the industry, although any additional production at this time is certainly welcomed by petroleum interests.

Structural Shapes . . .

Structural Shape Prices, Page 105

Boston — Low unit bid on structural steel, delivered superstructure, Augusta, Me., bridge was 11.45 cents a pound with 4.85 cents for erection. There are 3100 tons in the contract which goes to American Bridge Co., Boston. High quotation among the four shops bidding was 12.83 cents and 6.34 cents respectively. Low on wrought iron rail, 4354 linear feet, was $9.60 delivered with $2.65 for erection. These estimates reflect the high and increasing costs for erecting structural steel, the erection contract coming to $300,312 compared with $709,900 for the fabricated steel delivered. Structural contracts include two for 550 tons placed by district contractors for outside projects and approximately 1100 tons in this area, mostly Connecticut, with Electric Boat Co., Groton, Conn., taking a 400-ton state bridge. Delivered price, Boston, on standard structural material is 3.28c, Bethlehem 2.80c with a 48-cent freight per 100 pounds.

Philadelphia — Structural demand continues to lag, with the outstanding award involving 440 tons for an overpass in Plainsboro, N. J., and with few awards of any size actually reported. High building costs are a deterrent factor; also the extended deliveries that most structural shops are now quoting. Few fabricating shops can offer shipments in less than five months and relatively few can do better than six months.

Chicago — Demand for fabricated structural steel holds at a level which is above the reach of suppliers. Fabricators have sufficient business on their books to occupy them through most of the balance of the year, based on the present rate of mill shipments of plain material. If interruptions to the flow occur, commitments will suffer. It is the practice of most fabricating shops to bid on only the most attractive jobs offered. A substantial part of new construction projects are public works, such as bridges, grade separations, and the like, and bids frequently are so far over estimates that bids are rejected.

Birmingham — Shape bookings continue relatively light, even in the face of considerable accumulation of pending demand. Bethlehem has been awarded 1,600 tons for the new plant of Beaunit Mills Inc., at Childersburg, Ala.

Seattle — Fabricators are severely handicapped by lack of steel and the situation is expected to be progressively more acute during the coming quarter. For this reason, they are unable to commit themselves beyond current inventories and anticipated shipments.

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New York — Estimated bookings of fabricated structural steel totaled 151,139 tons in April compared with 213,123 tons in March, according to the American Institute of Steel Construction Inc., this city. This brings the total for the first four months to 655,015 tons, an increase of 21 per cent over bookings for the like 1947 period, and 49 per cent greater than in the averaged four months of the five prewar years of 1936-1940. April shipments are estimated at 149,341 tons, for the four months, 604,289 tons, an increase of 6 per cent over the corresponding period last year. Tonnage available for fabrication within the next four months only is 630,217 tons, against 631,636 a year ago.

The institute announced the following revisions in contract totals: January, 160,634 tons; February, 130,119 tons; and March, 213,123 tons; in shipments: January, 146,363; February, 141,556; and March, 167,029 tons.

Rails, Cars . . .

Track Material Prices, Page 105

Seattle — The 37,500 net tons of 115-pound rails for the Alaska Railroad, awarded to Columbia Steel Co., will be rolled at the Gary, Ind., plant. Shipments will be routed through Seattle, half this season and the balance in the summer of 1949. This award was previously announced.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 104

Seattle — Demand for reinforcing bars continues at maximum levels, the bulk of it ranging from 10 to 50 tons. Output of local mills is temporarily reduced, Bethlehem Pacific Coast Steel Corp.'s plant being shut down for ten days becaue of a motor blowout and Northwest Steel Rolling Mills Inc.'s mill running only four days weekly due to shortage of ingots. Bethlehem will continue ingot production while the mill is idle. Mill backlogs are larger than normal, new business being in excess of current output.

Tin Plate . . .

Tin Plate Prices, Page 105

Pittsburgh — Producers are recognizing the $6.90 price base at Granite City and $6.80 at Warren, O., on hot dipped tin plate until official position is announced by Republic Steel Corp. and Granite City Steel Co. Shipments are being billed on the basis of which base price, the old or the new, is cheaper to end user. Increased freight rates mean greater freight absorption for Pittsburgh mills in shipping into the East. Seasonal delivery pressure for tin mill products is still in evidence, particularly among the many consumers who have not been able to augment inventories sufficiently to take care of peak demands. General shortage of tin plate is reflected in the fact that some consumers are willing to accept excess area sizes, which results in above-normal scrap losses.

Wire . . .

Wire Prices, Page 105

Pittsburgh — Producers report deliveries are falling further behind schedule, primarily reflecting extremely heavy volume of new orders. Production schedules have been fairly well sustained since termination of the coal strike, although occasional slowdowns occur over wage incentives at some plants. Sellers report slight easing in demand for rope wire and steel balls, but this is offset by pressure for early delivery of nearly all manufacturers' and merchant wire items. Price range of 10 cents continues here on merchant quality galvanized and annealed wire. while substantially larger price range is noted on nails, woven fence and barbed wire.

Birmingham — Wire users apparently are going to be disappointed in their anticipation of increased supplies in the third quarter. No mill statements have been made, but the general feeling now is that supply will show no improvement before the last of the year, if then.

Warehouse . . .

Warehouse Prices, Page 107

New York — The small consumer dependent on warehouse for steel is confronted with additional shortages as third quarter allocations to distributors are generally lower, notably on structurals, plates, bars and flat-rolled. With inventories small and out of balance, warehouses are unable to meet demand which is heavy. July tonnage will be limited, especially with that month blanked out on numerous products. There is a general tightening in most items, including cold-finished bars and alloys which up to now have not been too critical. Cold-drawn mechanical seamless tubing is one of the few products on which there is any easing. Prices are mixed; some distributors have not revised lists while changes in others are not uniform, quotations varying as to source of supply.

Pittsburgh — A number of steel distributors have not yet reduced their warehouse prices on structurals, sheets and strip. Country price range of $5.40 to $5.50 per 100 pounds is now in effect on galvanized sheets, 10 gage; $6.65 to $6.75 for 24 gage galvanized; $4.85 to $4.95 on cold-rolled sheets; $4.05 to $4.10 on hot-rolled sheets; and $4.15 to $4.20 on hot-rolled strip. Prices for cold-finished carbon and alloy bars, hot-rolled carbon and alloy, structural shapes and plates have been uniformly reduced in line with mill reductions announced by leading producers.

Inventory situation continues very critical on most steel warehouse items, despite slight improvement in mill deliveries. This condition exists for cold-finished carbon bars and alloy items, as well as other major products.

Philadelphia — Some leading warehouses report business in the month now closing as being ahead of April,

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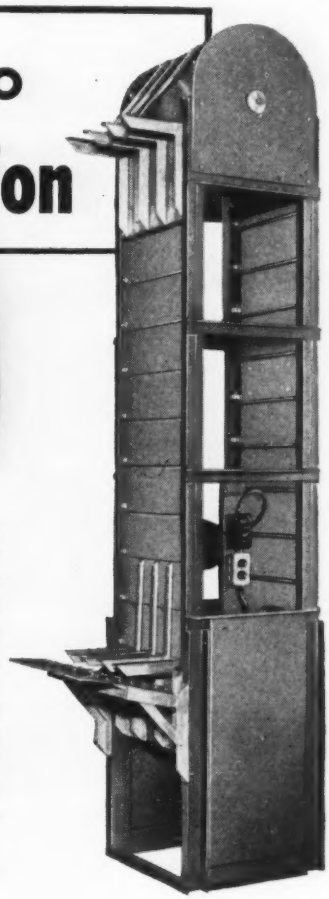

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- **BELT**—heavy 18 gauge steel.
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- **LOAD LIMIT**—(recommended) 50 lbs. per arm. This can be exceeded 50%.
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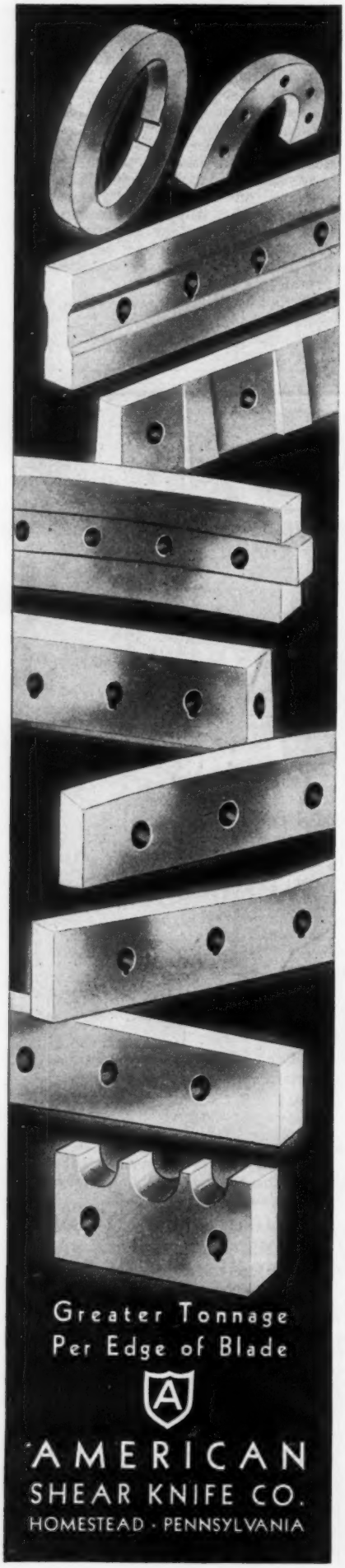

while certain others regard business as being at a standoff, with little important variations one way or the other. Most jobbers, however, report mill receipts as being heavier than in April. Meanwhile, there is a continued lack of price uniformity, although competition should have a leveling effect shortly.

Chicago — Extremely heavy demand and depleted and unbalanced stocks continue to characterize the warehouse situation here. From all indications, the picture is likely to remain unchanged for some time to come. Consumers are turning to distributors to make up steel deficiencies created by inadequate mill quotas or deliveries lost during the coal strike. Prospects for building stocks are definitely not good, in fact, in third quarter warehouses must get along on smaller quotas, the same as all other mill customers. Most acute shortages are in flat-rolled goods, followed by carbon bars and light shapes and plates. Alloys have increased in demand, reflecting the shortages in carbon products.

Cincinnati — Prices on warehouse steel have not yet become stabilized, with further changes in prospect. Jobbers' quotations failed to show uniform action in response to lowered mill prices and the higher freight rates. Demand, especially for sheets, plates and structurals, continues strong against inadequate supply.

Seattle — Wholesale jobbers state that business has slowed this month although there is a continued urgent demand for scarce items, principally sheets, nails and plates. Whether this change is due to seasonal decline, following peak turnover in March and April, or to postponement of many projects until materials are available, is not known. Heavy government buying has diverted the market from normal channels. Mill deliveries are being delayed following the recent eastern coal strike, effects of which will be felt for several months. Generally, stocks are badly broken and some lines are extremely short. New price schedules are out, following recent adjustment of mill prices.

Wisconsin Steel Adopts Fob Mill Pricing Basis

Chicago — Wisconsin Steel Co. recently notified customers that effective as of May 15 all sales and shipments of iron and steel products made by it will be on the basis of fob mill, South Chicago, Ill. Company explains its action as one of plain economics, the matter of freight absorption having become too burdensome. Not more than one-fifth of the company's product is sold in the open market, the bulk of the output going to plants of the parent company, International Harvester Co.

Iron Ore . . .

Iron Ore Prices, Page 106

Cleveland — Shipments of Lake Superior iron ore from upper lake ports increased to 2,636,274 tons for the week ended May 24 from 2,556,585 tons for the preceding week, according to the Lake Superior Iron Ore Association, this city. This brought the season's cumulative total to 16,139,243 tons compared with 12,208,397 tons for the like 1947 period.

Shipments from United States ports during the week ended May 24 totaled 2,587,080 tons, or an average daily loading of 369,582 tons, making the season's cumulative total 15,981,589 tons, or an increase of 3,950,446 tons over the like period last year.

Pig Iron . . .

Pig Iron Prices, Page 106

Pittsburgh — Sellers of merchant iron here have not yet increased prices in line with those announced by southern producers around the middle of this month. However, the entire subject is under consideration for production costs have increased substantially, reflecting higher freight rates, iron ore and coke prices. Still higher coke prices are indicated for this summer.

Pittsburgh Steel Co. was scheduled to blow in its recently purchased DPC 1100-ton blast furnace at the close of last week. The company has blown out one old blast furnace for relining and when this is completed, its other furnace will also be relined. Difficulty in obtaining sufficient amount of coke, ore and limestone makes it necessary for the company to operate only two of its blast furnaces at one time. For this reason the company will have no merchant pig iron for sale, for it intends to use the additional iron for its own operations to offset need for large scrap purchases. When the blast furnace relining program is completed, the company estimates about 50 per cent more iron will be available for its internal operations.

Boston — Correction of the melt mixture, now abnormally high in scrap, will be the first step with most consumers once the supply of pig iron improves. More iron is not in sight, but a return to normal scrap-iron ratios will come ahead of any inventory building when additional tonnage is available. Only in silvery is the outlook for slightly more tonnage likely in the near future. New England melters of foundry and malleable grades are also confronted with higher prices for Mystic iron. Extent of the increase depends on costs over the last three months now being figured, but these costs have increased in the last year sharply and this is the last month for $45 iron. Shops usually melting iron on a 60-40 basis are now employing 80 per cent scrap with 20 per cent pig iron. This lengthens machining time, increases rejects, batters grinding and cutting tools while machine shop labor, working a piece basis, is grumbling.

Philadelphia — Most consumers in this district received more pig iron in the month now closing than in April when shipments were disrupted by the coal strike. However, buyers did not receive nearly as much iron as they requested and it is likely that they will continue to press hard for tonnage, especially as long as scrap prices continue at their present high levels. Actually coke is more scarce than pig iron, due to restricted shipments by oven coke producers in this

district. One district producer had announced earlier that he would cut off all foundry coke shipments during the closing two weeks of this month because of need for extra repairs. This seller, however, suspended for only one week and then resumed in the final week. Nevertheless the overall effect is going to be about the same, inasmuch as all shipments are going to be held up during the first week in June.

New York — Indications point to a further increase in pig iron production for at least another month. Producers have recovered from the recent coal strike and should develop even better production during June and possibly beyond, unless confronted with another coal strike. Supply, however, will continue to fall short of demand, with the high cost of scrap, causing foundries to put special pressure on the furnaces for iron.

Chicago — Foundry operations in this area returned to normal last week with more than 3000 members of the International Molders and Foundry Workers Union (AFL) accepting a 12-cent an hour wage increase offered by about 40 shops affiliated with the Chicago Foundrymen's Association. Work resumed May 24 after being idle three weeks while the workers conducted a strike. The increase boosts pay of laborers to $1.24 an hour and journeymen to $1.69.

Foundries accepted deliveries of iron and coke during the strike and thus resume with reasonably good inventories. Other shops which suffered no work stoppage are operating on a hand-to-mouth basis insofar as raw materials are concerned. Since it is the practice of foundries to melt up to the limit of materials on hand, suppliers are under considerable pressure to keep shipments rolling. Both pig and coke are inadequate to meet consuming demand. Merchant iron-making capacity is almost completely engaged, indicating that substantial shortage will continue for some time. Of the district's 42 blast furnaces, 39 are operating.

Buffalo — Although gossip about the possibility of higher pig iron prices seeped through the trade, the really tangible news centered on a tapering off in operations among leading gray iron foundries. Malleable remained tight but a slackening was noted in gray iron as two of the top melters in this field were looking for new business and accepted jobbing orders. On the other hand, malleable users were pleading for additional iron as operations have been slashed because of insufficient stock. The falling off in gray iron was attributed to casters catching up on home appliance business.

Producers generally felt that no immediate increase in pig iron prices was likely in view of the move to either cut or hold steel prices.

Cincinnati — Pig iron shipments have picked up, to a volume near that established prior to the coal miners' strike. Effects of the recent curtailment in shipments are still noted in the extremely tight supply situation. However, some foundries are hit most seriously by shortage of coke. Hence, the melt in the district has not rebounded to the degree expected. Announcement of two Southern pro-

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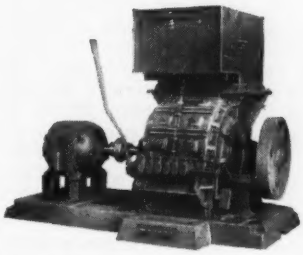

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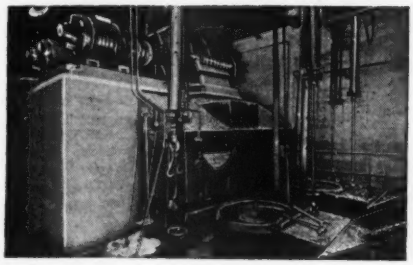

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Birmingham — Even though a greater proportion of Southern iron is going into Southern markets generally, there is no noticeable improvement in the overall supply situation, according to larger users. Most of these have regular sources of supply and are being taken care of on a regular basis, but not in sufficient quantity, as has been the case since the early days of the war. The deficiency continues to show up in production schedules.

St. Louis — Missouri-Illinois Furnaces Inc., has announced that pig iron production will be cut in half beginning July 1 when one of its two furnaces will be shut down for relining. It will be out of blast from six week to two months depending on how well the salamander drains. The 500 tons daily capacity of the other furnace will be prorated among consumers in this district, although Granite City Steel Co., which takes its metal in hot form, presents a special problem. Normally one furnace is devoted to basic iron and the other to foundry. Present plans are to turn out basic of a formula to which foundries can add silicon to meet their needs. Eighty per cent of Missouri-Illinois customers are in the St. Louis area, and the furnace curtailment may force reduced operations on a number of captive and jobbing foundries. A paradox, however, is that local cast scrap prices remain soft, indicating that some may still have good stockpiles accumulated during the April coal strike. Present pig production is 95 per cent of capacity.

Scrap . . .

Scrap Prices, Page 110

Boston — Steelmaking scrap prices are steady and for the most part unchanged with buying moderate. More melting steel scrap is coming out and private deals and exchanges for industrial scrap are less numerous. Considerable tonnage is represented in ships to be scrapped at several tidewater points. Ship-breaking is costly for most yards, but the sale of parts

Pittsburgh—New mill buying generally is restricted to relatively small lot tonnages, although one major interest is reported to have placed orders for over 50,000 tons the past few weeks at formula prices. Mill inventories were substantially augmented during the coal strike period and this trend is continuing, although at a much slower rate since full production has been resumed. Despite failure of leading mills to purchase open-hearth grades below formula levels, there is no immediate prospect of higher prices at this time, according to some trade leaders. One argument is that the trend toward lower steel prices, which will accrue to the benefit of consumers, is dependent to a great extent on holding the cost levels on raw materials. It is contended that steel consumers are well aware of this fact and undoubtedly will cooperate in doing their share in sale of their scrap at reasonable price levels. Some scrap is delivered here at above the $2.50 springboard, but this tonnage is very small in relation to the overall volume of remote scrap.

Philadelphia — Scrap prices have recently shown greater steadiness than at any time in weeks. Whereas usually there is some fluctuation in one grade or another, the market over the past week has shown no change in any grade. Steel scrap consumers are building up their inventories to some extent, but are still taking in all the tonnage being offered, except in certain instances where quality is so poor they do not feel justified in doing so—and even in cases where quality is poor they more often than not accept the scrap at a reduced price rather than reject it entirely.

The undertone in cast scrap, especially in heavy breakable and charging box cast, is less strong, but prices nevertheless still hold.

Cleveland—The improved flow of scrap of recent weeks has strengthened inventories and as a result mills are insisting on better grading and preparation of material. Because lightness of scrap has caused considerable loss of time in steelmaking, mills are now demanding that No. 2 heavy melting steel be cut into shorter lengths to make heavier charges possible.

Although the scrap flow is improved considerably over that of last winter, formula prices remain unchanged. However, the pressure that existed then for price boosts has been liquidated and fewer instances of over-the-formula payments have been heard in recent weeks. Actually, sellers are netting somewhat less now for scrap inasmuch as some mills declined to absorb the recent railroad freight rate increase.

Indicating that the coke and pig iron supply of foundries may be recovering from the recent coal mining disruption, a scrap dealer representing a western Pennsylvania foundry has contacted Cleveland district scrap dealers by postcards offering to pay $72.50 per gross ton delivered for No. 1 cupola cast. Current price at Cleveland is unchanged, $67 to $69, with other foundry grades also unchanged.

Watervliet, N. Y. — Procurement Section, Watervliet Arsenal will open bids June 3 for following amounts of metal scrap: 2000 pounds of high-speed tool scrap; 20 gross tons of miscellaneous iron and steel scrap (broken tools, light iron, tin, etc.); 75 tons of unprepared heavy melting consisting of reamer bodies, breech blocks and rings; 135 tons unprepared heavy melting consisting of 16-inch tube liners; 100 tons consisting of gun tubes, assorted sizes; 2000 pounds of baled, clean, solid copper wire; 2000 pounds of dirty aluminum scrap; 500 pounds of clean aluminum scrap; 500 pounds of aluminum chips and turnings.

Buffalo — While the majority of the leading scrap dealers were busy shipping against recent orders accepted at the formula, there were still some who refused to recognize the formula bid. These dealers were insisting that consumers absorb the increased freight charges on new orders before doing business at the

formula. The two top mills which placed the recent orders would not listen to such a deal. Meanwhile, an outside buying source continued to do business in the midstate area at prices about $2.50 a ton above the local formula price of $39.75 a ton for heavy melting and bundles. But dealers are becoming wary of accepting orders because of an increased number of rejections on deliveries.

With one of the leading users of cast scrap tied up by a strike, an easier tone was noted in some trade talk for cupola grades. Prices, however, remained the same with sales reported for mixed cupola within the range $63 to $65.

Cincinnati — Scrap prices are unchanged, although demand has turned spotty. Some melters appear eager for tonnage whereas others are not, and in isolated instances are holding up shipments. Bids on recent railroad lists also tended to dispute softening of the market on open hearth grades. Cast is easier, as a result of a heavier flow of material and the difficulty of some foundries in obtaining coke.

Birmingham — Flow of scrap, while not as great as earlier this month, remains fairly steady. Some dissatisfaction is expressed here and there over quantity. Price structure remain unchanged.

St Louis — Scrap shipments in this district continue a moderate decline, probably attributable to farmer preoccupation with field crop work and to a recent 3-week period of bad weather. Melting steel prices have held to the formula since early January. Specialties are unchanged. Cast grades remain soft despite a warning by Missouri-Illinois Furnaces Inc. that it will cut pig production 50 per cent July 1 for furnace relining. The lack of a consequent rush for cast scrap suggests either that foundries' business is falling off (which they deny) or that they stockpiled adequate cast during the April coal strike. For 60 days after late March there was a scramble for cast, particularly by the big mills. Brokers, however, expect higher cast prices soon in anticipation of a new coal walkout. Railroad scrap offerings have been unimportant lately.

Seattle — Scrap is arriving at tidewater in good volume. Mills are building inventories and the outlook is favorable for the balance of 1948. The price remains firm at $26 for heavy melting. Increased shipments from the country districts are reported while shipbreaking plants are operating steadily and contributing large tonnages to the stockpiles. Bethlehem Pacific Steel Corp. will break 6 LST's at Seattle and Everett plants, each unit yielding 1300 tons of scrap.

Cast iron scrap is not plentiful, foundries using increased tonnages of this material in view of the existing scarcity of pig iron.

PIPE . . .

CAST IRON PIPE PENDING

263 tons, 8 to 4 inch, bids opened at Bremerton, Wash., May 26.

150 tons, 6 inch; award pending at Snohomish, Wash.

130 tons, 8-inch Burlington Municipal airport, Burlington, Vt.

Unstated, over 25,000 feet 3 to 8 inch, Class 150 alternatives considered; bids to King county district No. 81, Rose Hill, Wash., June 1.

Unstated, over 50,000 feet, fittings and deep well turbine, for King County district No. 72; bids to Kirkland, Wash., June 8, also alternatives.

STEEL PIPE PENDING

Unstated, 6,000 feet 24 inch supply line for Seaside, Oreg.; Grimstad & Vandervelt, Seaside; general contractors, low $26,690.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

4500 tons, for 280 transmission towers for Ohio Public Service Co., Cleveland, for line between Dilles Bottom, O., and Ashland, O., to American Bridge Co., Pittsburgh.

1600 tons, new plant, Beaunit Mills Inc., Childersburg, Ala., to Bethlehem Steel Co.

1000 tons, chemical plant addition, Shell Oil Co., Houston, Texas., to Consolidated Steel Co.; Harold Van Buskirk & Co., Houston, general contractor.

575 tons, store building, W. T. Grant Co., Providence, R. I., to American Bridge Co., Pittsburgh; Morton C. Tuttle Co., Boston, general contractor.

550 tons, plant building, New Haven Pulp & Board Co., New Haven, to Bethlehem Steel Co.; Westcott & Mapes, general contractor.

440 tons, overpass over the Pennsylvania Railroad, Plainsboro, N. J., through Brann & Stuart, Philadelphia, general contractors, to the American Bridge Co., Pittsburgh.

400 tons, 250-foot two-span welded continuous girder bridge, Woodbridge, Conn., to Electric Boat Co., Groton, Conn.; D. V. Frione & Co., Inc., general contractor.

400 tons, Alaska Railroad terminals, Fairbanks, to Pacific Car & Foundry Co., Seattle; Morrison & Knudson, general contract.

350 tons, Coulee dam powerhouse, furnished by Government, erected by Sparling Steel Co., Seattle.

200 tons, including 50 reinforcing, Washington state bridge, Cowlitz county, to Gunderson Bros., Portland, Oreg.; Hawkins & Armstrong, Seattle, general contract.

200 tons, textile mill, Lebanon, Pa., to Reading Steel Products Co., Reading, Pa.

140 tons, sub-station, Baton Rouge, La., to Lehigh Structural Steel Co., Allentown, Pa.; Stone & Webster Engineering Corp., Boston, contractor-engineer.

100 tons, 2-story building, Home Federal Savings & Loan Institution, Ridgewood, New York city, to Grand Iron Works Inc., that city.

100 tons, factory building, Metals & Controls Corp., Attleboro, Mass., to Groisser & Shlager Iron Works, Somerville, Mass.; Rowley Construction Co., Pawtucket, R. I., general contractor.

100 tons, state bridge, York county, Pennsylvania, to Bethlehem Steel Co.

Unstated tonnage, turbines, Jim Woodruff dam, Apalachicola river, Florida, to Newport News Shipbuilding & Dry Dock Co., Newport News, Va., $1,399,389, U. S. Army Engineer, Mobile, Ala., inv. 105.

STRUCTURAL STEEL PENDING

2000 tons, Van Wyck expressway, Queens, New York city; bids to be opened by the New York State Highway Department, Albany.

800 tons, Public School No. 111, Long Island City, New York, to Psaty & Fuhrman Inc., general contractor.

600 tons, beam spans, various locations, Vermont; bids in on structural steel direct.

188 tons, Tri-State highway, sec. 2626.1 HF, Cook County, Ill., for State Highway Division; American Bridge Co., Pittsburgh, low on bids Apr. 30.

150 tons, including 40 tons reinforcing, Wash-

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ington state bridge, Cowlitz county; Lockyear & White, Seattle, low, $87,978.

140 tons, 185-foot three-span rolled beam bridge, Middletown, Conn.; bids June 1, State Highway Department, Hartford.

130 tons, state highway bridge, North Adams, Mass.; bids June 1, Department of Public Works, Boston.

100 tons, superstructure, WF beam bridge, Rutland, Vt.; bids June 4, Montpelier.

Unstated tonnage, Morris Lowenstein Pavillion, 263rd Street, off Union Turnpike, Queens, New York city, general contract awarded to George A. Fuller Co., that city.

Unstated, state highway bridges Missoula and Musselshell counties, Montana; bids to Helena, June 22.

Unstated, two railroad bridges, West Canal, Columbia Basin project; bids to Bureau of Reclamation, Denver, June 10.

REINFORCING BARS . . .

REINFORCING BARS PLACED

4000 tons, Bacon siphon, South Coulee dam and Coulee right powerhouse, furnished by the government, being erected by Sparling Steel Co., Seattle.

850 tons, veterans hospital, Spokane, Wash., to unstated California interest; Robert E. McKee Construction Co., Los Angeles, general contractor, low $2,450,000.

491 tons, Oregon state building, Salem, reported placed with Mercer Steel Co., Portland; Sound Construction & Engineering Co., Seattle, general contract.

220 tons, Alaska Railroad terminals, Fairbanks, to Bethlehem Pacific Coast Steel Corp., Seattle; Morrison & Knudson, general contract.

150 tons, University of Washington steam generating plant, Seattle, to Bethlehem Pacific Coast Steel Corp., Seattle; Strand & Co., Seattle, general contract.

115 tons, boiler and shop buildings, Union Bag & Paper Co., Savannah, Ga., to Virginia Steel Co., Birmingham; Morton C. Tuttle Co., Boston, general contractor.

100 tons, chemical plant addition, Shell Oil Co., Houston, Tex. to Ceco Steel Products Co., Houston; Harold Van Buskirk & Co., Houston, Tex., general contractor.

REINFORCING BARS PENDING

3605 tons, Davis dam project; bids in to construction engineer, Department of Interior, Davis dam, Nev.

3200 tons, Woodside Houses, Woodside, Queens, New York city, George Driscoll Inc., low on general contract, according to City Housing Authority.

600 tons, state highways, Manchester, South Winsor and Vernon, Conn.; bids June 9, State Highway Department, Hartford.

Unstated, highway projects; bids to Helena, Mont., June 22.

Unstated, 250,000-bushel grain elevator, Arlington, Oreg., for Kerr, Gifford & Co., Portland, Oreg.; general contract to George H. Buckler, Portland.

RAILS, CARS . . .

RAILROAD CARS PLACED

Erie, 30 steel baggage and express cars, to the American Car & Foundry Co., New York.

RAILROAD CARS PENDING

Illinois Central, 4975 freight cars, program approved by the Board of Directors; of the total 3000 hopper cars will be built in company shops at Centralia, Ill., while orders will be placed with outside builders for 1500 hoppers, 100 covered hoppers and 375 flat cars. These cars represent a portion of the railroad's 1949 program and will be in addition to the 6376 cars placed against the 1948 program.

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CONSTRUCTION AND ENTERPRISE

ALABAMA

BIRMINGHAM—Birmingham Gas Co. plans a $1,500,000 expansion of its natural gas distribution system.

ARKANSAS

LITTLE ROCK, ARK.—Little Rock Chamber of Commerce is sponsor for a $200,000 plant to be built on W. Roosevelt Rd. Facility will be leased to Essick Mfg. Co., Los Angeles, for production of evaporative air cooling equipment.

CALIFORNIA

LOS ANGELES—Armco Metal Co., 409 LeRoy St., plans to build a $95,000 office and factory building at 6155 S. Malt Ave.

LOS ANGELES—Burroughs Adding Machine Co. has awarded a $200,000 contract to George W. Carter, 1721 W. Olympic Blvd., for construction of a 2-story office building at 1641 Wilshire Blvd.

SAN LEANDRO, CALIF.—L. A. Young Spring & Wire Co., 900 High St., Oakland, will build a $1 million plant here for the manufacture of seat springs.

TORRANCE, CALIF.—Anderson-Carlson Mfg. Co., 1739 213th St., is installing a new $250,000 electroplating unit.

CONNECTICUT

DEVON, CONN.—Connecticut Light & Power Co., 36 Pearl St., Hartford, has awarded separate contracts totaling $5 million for construction of a steam power generating plant, including installing two turbo generators.

IDAHO

STIBNITE, IDAHO—Bradley Mining Co., San Francisco, has awarded a $1,400,000 contract to Western Knapp Engineers for construction of a smelter here to reduce antimony and gold ore from the Yellow Pine mine.

INDIANA

HAMMOND, IND.—Lever Bros. Co. has awarded a contract to Chemical Plants Division, Blaw-Knox Co., Pittsburgh, to design and erect a complete fatty acid production plant.

INDIANAPOLIS — American Foundry Co., Blaine Miller, president, 1535 Naomi St., plans to build a $3 million manufacturing plant.

KANSAS

OSAWATAMIC, KANS.—Missouri Pacific Railroad, R. P. Hart, chief engineer, Missouri-Pacific Building, St. Louis, will build a $500,000 railroad shop.

NEW JERSEY

CAMDEN, N. J.—Di Medio Lime Co., 18th and Federal Sts., has awarded separate contracts totaling $70,000 for a storage facility.

TRENTON, N. J.—Crescent Insulated Wire & Cable Co., 319 N. Olden Ave., has awarded separate contracts totaling $150,000 for construction of a plant.

SEWAREN, N. J.—Vulcan Detinning Co. has awarded a $400,000 contract to Wigton-Abbott Corp., 1225 South Ave., Plainfield, for construction of a tin smelting plant.

OHIO

ASHTABULA, O.—Electro Metallurgical Co. plans to build three lime kilns, including screening and storage facilities, on its Lake Rd. plant site.

CLEVELAND—Federal Foundry Supply Co., 4600 E. 71st St., will build a $100,000 factory addition.

CLEVELAND — Industrial Parts Co., E.

WHAT EVERY PERSON OVER 21

SHOULD KNOW about advertising

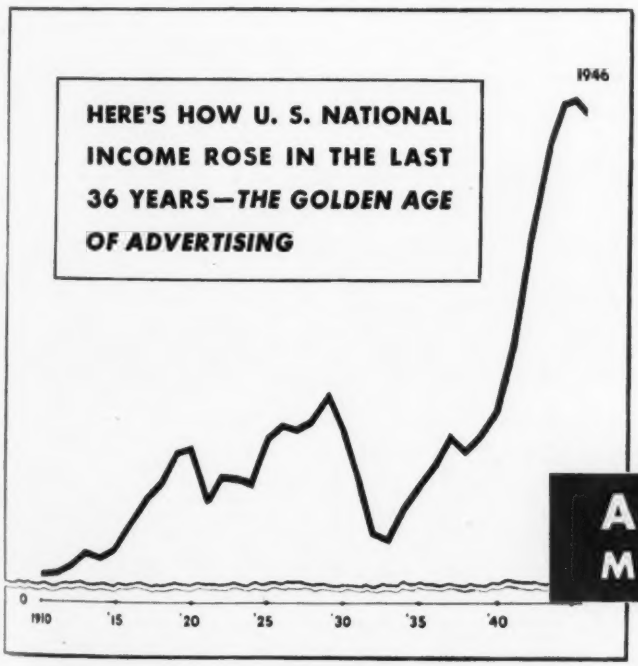
I AM an ad. And everyone who has a job or wants one should know what I do.

For it's advertising—by selling more goods to more people—that makes jobs, and makes jobs *more secure.*

Whether you want a job or want a better one, remember—jobs all along the line depend on somebody selling something to somebody else. And advertising is the lowest cost way yet devised to sell goods.

That's why advertising is called the spark plug of American business. Advertising makes the wheels go around. For advertising's job is to sell. When more goods are sold, there are more jobs and better jobs for everyone. Selling less goods means failures, pay cuts, layoffs.

So whenever you see or hear advertising, don't forget that it's helping you. If it weren't for advertising's low-cost way of selling goods, you couldn't have such a secure job or opportunity in the future.



This rise in the standard of living for you and yours is unequalled in all history. Advertising helped raise this standard—is needed even more today to sell industry's new developments.

OTHER WAYS ADVERTISING HELPS YOU AND YOUR FAMILY

1. Brings you better goods for less money.
2. Makes shopping more pleasant and easier.
3. Gears consumer demand to production, to create prosperity.

Advertising... BY SELLING MORE GOODS TO MORE PEOPLE
Makes your job more secure

Advertising Federation of America

Rogers, president, has work under way on a $100,000 project to rebuild and alter its plant at 1360 W. Ninth St.

CLEVELAND—Diesel Engine Division, General Motors Corp., 2160 W. 106th St., is making 26 diesel generating sets for Argentina at a cost of $2,500,000. Two have already been delivered.

CLEVELAND—National Advisory Committee for Aeronautics, Brookpark Rd., will spend $375,000 for an addition to the heating plant buildings at Brookpark and Grayton Rds. Another $225,000 will be spent on a second story addition to an existing building, to be used as an air dryer for supersonic tunnels.

TOLEDO, O.—Gulf Refining Co., Warren C. Gifford, district manager, 2935 Front St., has awarded a $1,396,000 contract to Badger & Son, 75 Pitts St., Boston, for construction of a catalytic cracking plant and topping still, and a $189,000 contract to Bates & Rogers Construction Co., 56 Granada St., for erection of a waste oil separation plant and complementary facilities.

PENNSYLVANIA

BRUCETON, PA.—Bureau of Mines has awarded a contract to Chemical Plants Division of Blaw-Knox Co., Pittsburgh, for engineering, procurement and erection services in the completion of a Fischer-Tropsch (synthetic liquid fuels) pilot plant here.

PHILADELPHIA—General Electric Co., 6901 Elmwood Ave., has awarded a $150,000 contract to Turner Construction Co., 1500 Walnut St., for erection of a factory addition.

PHILADELPHIA—Gulf Oil Corp., 1515 Locust St., plans an $80,000 project to include construction of eight chlorinator buildings at 30th St. and Penrose Ferry Ave.

PHILADELPHIA — Gulf Refining Co., 1515 Locust St., has awarded a $250,000 contract to Turner Construction Co., 420 Lexington Ave., New York, for construction of a warehouse at 30th St. and Penrose Ferry Ave.

POTTSTOWN, PA.—Pottstown Metal Welding Co., 46 W. High St., will build a $70,000 addition to its plant.

WILLIAMSPORT, PA. — Reading Railroad, Reading Terminal, Philadadelphia, has awarded a $100,000 contract to Lundy Construction Co., 1896 W. Fourth St., for building additions and improvements to diesel shop facilities here.

TEXAS

BEAUMONT, TEX.—Beaumont Forging Co. will build an $85,000 plant unit.

BRAZORIA, TEX.—Phillips Petroleum Co., Bartlesville, Okla., plans a $5 million gas line extraction plant.

CORPUS CHRISTI, TEX.—Southwestern Oil & Refining Co., Port and Summers Sts., will build a $450,000 refinery unit, including catalytic reformer and polymerization units, near here.

DAINGERFIELD, TEX. — Lone Star Steel Corp. will spend $7 million for construction of a pipe manufacturing plant and $2 million for expansion of its iron ore production plant.

DALLAS, TEX.—Army Air Forces has awarded Texas Engineering & Mfg. Co. a $2,500,000 contract to overhaul completely 45 Douglas C-54 transports.

DALLAS, TEX.—Intercontinental Mfg. Co. has completed arrangements with Texas Engineering & Mfg. Co., Grand Prairie, for the assembly of 26 hp, all steel frame farm tractors. Eventual production of 500 units monthly is planned.

FT. WORTH, TEX.—Consolidated Chemical Industries Inc., Denton Ave., will build a factory addition and will remodel, at a total cost of $100,000.

FT. WORTH, TEX.—Ft. Worth Steel & Machinery Co., 3600 McCart St., plans to reconstruct portions of its steel plant at a cost of $100,000.

HOUSTON, TEX.—Highland Industrial Terminal, c/o Hugh January, will be built as an industrial subdivision on a 137-acre site north of Seventh St. near Katy Railroad's Eureka Terminal. Offering sites for 70 industries, the development will be built at a cost of $10 to $15 million.

SWEENY, TEX.—Alamo Refinery Co. plans a $700,000 refinery expansion.

UTAH

SALT LAKE CITY, UTAH—Structural Steel & Forge Co., a division of Elmco Corp., plans to build a $1 million pipe manufacturing plant here. Mill will rely on Geneva Steel Co. for its steel supply.

WASHINGTON

VANCOUVER, WASH.—Carborundum Corp., Niagara Falls, N. Y., announces that construction on its $12 million plant here will begin in June. Work will be done by Elaw-Knox Construction Co. and Nicholson Co.

WYOMING

CASPER, WYO.—Socony-Vacuum Oil Co. Inc., 26 Broadway, New York, announces that practically all phases of a general expansion, improvement and rehabilitation program are now under way at its refinery here. Completion of the program is scheduled for next December.

PRICES OF LEADING FERROALLOYS PRODUCTS

(*Concluded from Page 107*)

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Eastern Zone, contract, carload, bulk, 8.7c per lb of briquet, c.l. packaged 9.5c, ton lot 10.3c, less ton 11.2c; Central, add 0.25c for c.l. and 0.6c for l.c.l.; Western, add 0.8c for c.l. and 2.5c for l.c.l. Freight allowed. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Eastern Zone, contract, c.l. bulk 8.75c per lb of briquet, c.l. packed 9.55c, ton lot 10.35c, less ton 11.25c; Central, add 0.25c for c.l. and 0.6c for l.c.l.; Western, add 0.8c for c.l. and 2.5c for l.c.l. Freight allowed. Add 0.25c for notching. Spot, add 0.25c

Silicon Briquets: (Large size—weighing approx. 5 lb and containing exactly 2 lb of Si). Eastern Zone, contract, carload, bulk 5.1c per lb of briquet, c.l. packed 5.25c, ton lot 6.7c, less ton 7.6c. **(Small size**—weighing approx. 2½ lb and containing exactly 1 lb of Si). Eastern Zone, carload, bulk 5.25c c.l. packed 6.05c, ton lots 6.85c, less ton 7.75c; Central, add 0.25c for c.l. and 0.6c for l.c.l.; Western, add 0.45c for c.l. and 0.9c for l.c.l. Freight allowed. Add 0.25c for notching, small size only. Spot, add 0.25c.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18%, and Si 53-59%). Eastern Zone, contract, carload, lump, bulk 17.50c per lb of alloy, carload packed 19.0c, ton lot 19.8c, less ton 20.8c; Central, add 0.5c for c.l. and 0.85c for l.c.l.: Western, add 2.55c for c.l. and 2.6c for l.c.l. Freight allowed. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Eastern Zone, contract, carload, lump, bulk 16.25c per lb of alloy, carload packed 16.45c, ton lot 19.35c, less ton 20.85c; Central, add 0.5c for c.l. and 0.75c for l.c.l.; Western, add 2.55c for c.l. and 2.90c for l.c.l. Freight allowed. Spot, add 0.25c.

VANADIUM ALLOYS

Ferrovanadium: Open Hearth Grade (Va 50-55%, Si 8% max., C 3% max.). Eastern Zone, contract, any quantity, $2.90 per lb of contained Va; Central, add 2c for c.l. and 3c for l.c.l.; Western, add 6c for c.l. and 9c for l.c.l. Freight allowed. Spot, add 10c. **Special Grade** (Va 50-55%, Si 4% max., C 1% max.), $3. **High Speed Grade** (Va 50-55%, Si 1.50% max., C .20% max.), $3.10.

Vanadium Oxide: All Zones, contract, less carload lots, $1.20 per lb of contained V_2O_5. Spot, add 5c.

Grainal: Vanadium Grainal No. 1, 93c; No. 6, 63c; No. 79, 45c; all fob Bridgeville, Pa., usual freight allowance.

TITANIUM ALLOYS

Ferrotitanium: (Ti 20-25%, Al 3% max., Si 4% max., C 0.10% max.). Eastern Zone, contract, ton lot, 2" x D, $1.35 per lb of contained Ti, less ton $1.40. (Ti 40-45%, Al 7% max., Si 4% max., C 0.10% max.). Ton lot $1.23, less ton $1.25; Central, add 4c for 20-25% Ti grade, and 2.1c for 40-45% grade; Western, add 13.5c for 20-25% Ti grade, and 7.2c for 40-45% grade. Freight allowed. Spot, add 5c.

Ferrotitanium, High-Carbon: (15-20%). Contract basis, per net ton, fob Niagara Falls, N. Y., freight allowed to destination east of Mississippi river and north of Baltimore and St. Louis, 6.8% C, $142.50; 3-5% C, $157.50.

TUNGSTEN ALLOYS

Ferrotungsten: (W 70-80%). Eastern Zone, contract, 10,000 lb W or more, $2.25 per lb of contained W; 200 lb W to 10,000 lb W, $2.35; less than 2000 lb W, $2.47. Spot, add 2c.

Tungsten Powder: (W 98.8% min.). Eastern Zone, contract or spot, 1000 lb or more, $2.90 per lb of contained W; less than 1000 lb W, $3.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloys: (Zr 12-15%, Si 39-43%, Fe 40-45%, C 0.20% max.). Eastern Zone, contract, c.l., lump, bulk 6c per lb of alloy, c.l. packed 6.75c, ton lot 7.5c, less ton 8.35c; Central, add 0.25c for c.l. and 1.1c for l.c.l.; Western, add 0.6c for c.l. and 3.95c for l.c.l. Freight allowed. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max.). Eastern Zone, contract, carload, lump, packed 18.4c per lb of alloy, ton lot 19.15c, less ton 20.40c; Central, add 0.6c for c.l. and 1.05c for l.c.l.; Western add 3.05c for c.l. and 4c for l.c.l. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min., Si 1.50% max., Al 0.50% max., C 0.50% max.). Eastern Zone contract, 100 lb or more, 1" x D, $1.20 per lb of alloy, freight allowed. Less than 100 lb $1.30; Central, add 0.75c; Western add 2.9c, freight allowed. Spot, add 5c.

Borosil: (3 to 4% B, 40 to 45% Si), $6.25 per lb contained B, fob Philo, O., freight not exceeding St. Louis rate allowed.

Bortam (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 0.90 to 1.15%). Net ton to carload, 8c per lb, fob Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

OTHER FERROALLOYS

Ferrocolumbium: Cb 50-60%, Mn 5% max., Si 8% max., C 0.5% max.). Eastern Zone, contract, ton lot, 2" x D, $2.50 per lb of contained Cb, less ton $2.55; Central, add 1.65c; Western, add 6.45c. Freight allowed. Spot, add 10c.

CMSZ Mixes: No. 4—Cr 45-49%, Mn 4-6%, Si 18-21%, Zr 1.25-1.75%, C 3-4.5%; No. 5—Cr 50-56%, Mn 4-6%, Si 13.50-16.0%, Zr 0.75-1.25%, C 3.50-5%). Eastern Zone, carload, 12 M x D, carload packed 17.25c per lb of material, ton lot 18.00c, less ton 19.25c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.3c for c.l.. and 3.05c for l.c.l. Freight allowed.

Silcaz Alloy: (Si 35-40%, Ca 9-11%; Al 6-8%, Zr 3-5%, Ti 9-11%, Boron 0.55-0.75%). Eastern Zone, carload, packed, 1" x D, 39c per lb of alloy, ton lot 41c, less ton 43c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.3c for c.l. and 3.05c for l.c.l. Freight allowed.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx.). Eastern Zone, contract, carload, packed, ½" x 12 M, 15.0c per lb of alloy, ton lot 15.75c, less ton 17.0c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.3c for c.l. and 3.05c for l.c.l. Freight allowed. Spot, add 0.25c.

Simanal: (Approx. 20% each Si, Mn, Al). Packed, lump, carload 10c, ton lots 10.25c, smaller lots 10.75c per lb alloy; freight not exceeding St. Louis rate allowed.

Ferrophosphorus: (17-19% based on 18% P content with unitage of $3 for each 1% of P above or below the base) Gross tons per carload fob sellers' works, with freight equalized with Rockdale, Tenn.; contract price $58.50, spot $62.25.

Ferromolybdenum: (55-75%). Per lb, contained Mo, fob Langeloth and Washington, Pa., furnace, any quantity 95.00c.